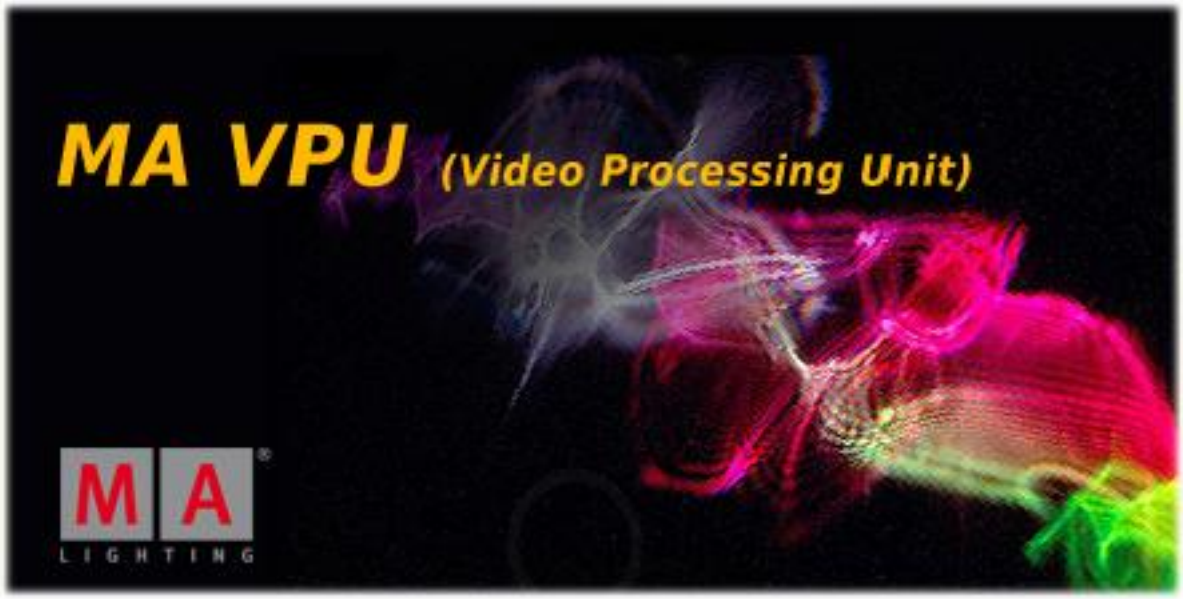

MA VPU
(former grandMA Video)

Operating Manual

Version 6.0

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Welcome to MA VPU

Thank you for placing your trust in this product.

This manual will provide all the necessary information for you to get the best out of your software.

The MA VPU is subject to continual development. It is therefore possible that the entire information printed in this manual is out-of-date.

Up-to-date information can always be found in the current readme.txt file on the CD or the downloaded program.

You can download the actual software version via: www.malighting.de

We need your help!

If you have wishes or suggestions please send us an e-mail tech.support@malighting.de .

Looking forward for a good cooperation

Your MA VPU team

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1 What is MA VPU ?

MA VPU, the **V**ideo **P**rocessing **U**nit is a media server, for both still and moving images, that is fully integrated into the grandMA lighting control system.

A solution for controlling, live-accessing and altering video, still images and 3D-objects in real-time
All videos, still images and 3D-objects can be scaled, positioned, tiled, colored and manipulated directly from any grandMA console
Several 3D Video Layers with full effects capabilities for high-resolution projections (e.g. 1920 x 1080 pixels, Note: VPU Basic max resolution is HD 1280 x 720)
Several Cameras for Shaper, Iris, FX Effects, Scaling, Camera Positions, Keystone, Softedge and 3D Objects
One Master for Shaper and Iris effects PC remote control functions
Straightforward set-up and configuration that utilizes bi-directional communication with the grandMA console; MA VPU is an integrated part of the grandMA network session
Instant live-access to any kind of image, 3D-object or video – including content-preview in your presets
Video In feature to fade in live videos
Synchronization of videos via MA network
Blind Programming support
Pixelmapper to control several LED walls via Artnet
EDID Manager can simulate an output device if nothing is connected
Warper mode to warp or straighten the projection

1.1 Main Features

MA VPU is the Video Processing Unit for the grandMA range of lighting control consoles. It uses a Windows PC to facilitate the control of video and still images directly from any grandMA console and runs on readily available PC hardware. As fully integrated part of the grandMA network system, MA VPU is not just triggered via DMX. This has many advantages. On the one hand a minimum of setup and configuration is required due to bi-directional communication between the console and the MA VPU. On the other hand the grandMA console allows for direct access to the server and previews the content as thumbnails in the preset.

The MA VPU enables a console operator to control and alter videos, still images and three-dimensional objects in real-time from a grandMA lighting console. Three-dimensional objects can be textured with video clips or animated images. Videos, still images and three-dimensional objects can be manipulated in multiple ways and in the same intuitive manner as a lighting fixture is manipulated from the grandMA console.

1.2 Functions and Features

At its most basic level, MA VPU allows for the control of several moving images and high-resolution images simultaneously. Videos and still images can be combined, mixed and controlled using any grandMA console like a regular multi-parameter fixture. For this, several 3D video layers are available plus one master layer for PC remote controlling, shaper, iris and scaling settings, layers for Shaper, Iris, Effects, Scaling, Camera Positions, Keystone and Softedge

In addition, MA VPU offers the possibility of choosing any three dimensional object as a surface for video or still images. Cubes, cylinders, spheres, extruded logos or any other three-dimensional shape can be “textured” with complimentary images or videos. The position and orientation of these three dimensional objects are fully controllable from the grandMA console. You could start with a cube rotating and progress to a three-dimensional logo flying around, but from then on, you are only limited by your imagination.

Each image or video that is used at the same time requires a layer. Since the brightness of each layer is controllable, it is possible to cross fade from one video image to another by cross fading from one layer to another. By controlling and mixing the output of the MA VPU, your grandMA console has become a video mixer.

1.3 Transition from grandMA video to MA VPU

This information conforms to grandMA video users changing to MA VPU.

As a user of a grandMA video dongle version (either on MA mediaPC or self designed media server) you will encounter most likely the following situation: grandMA video software is installed on a computer (self designed or mediaPC) with some content likely the MA original content plus additional custom-made content. Mainly this will be any QuickTime coded content. The grandMA video software might be also installed on additional computers like laptops to use it as pre-visualization or control suite stations without any dongles in use.

Now, you can choose from one of the following options:

Leave everything as it is.
You can stay with the grandMA video software and your known content. Please be aware that the grandMA video software as known today will not be further developed nor be implemented in future grandMA software releases. The grandMA video software will only work with grandMA 'series 1' software 6.121 or lower.

Update your MA mediaPC or media server to MA VPU software and benefit from the features of MA VPU plus
Performance increased tremendously – at least 4+ layer of 1080p are possible with 60fps.
The VPU is more integrated into the network than grandMA video ever was
Effects are added per layer and per output – each of them can handle 4 effects at the same time.
Colorkeying is built in now – even with a tolerance value for smooth transitions.
3D keystone is possible by adding a 3D model on the layer (real warping to come in one of the next releases)
Much easier Fixture handling by only 3 fixture types – the output fixture includes keystone, master, softedge and so on…
Prepared for Pixelmapping "in the console" – but still all other ways are available.

The VPU is able to run either with grandMA 'series 1' or grandMA2 – safe investment. The VPU software comes with a new decoder to ensure best content results. That means – however – that new content is needed and the new one is based on MPEG-2! Attention: All custom-made content needs to be rendered into MPEG-2. All old show-files are obsolete due to the fact that the new fixture types are not equal to the grandMA video fixture types!

Trade in your grandMA video dongle for a MA VPU If you wish to benefit from the MA VPU's hardware improvement and all future possibilities of the MA VPU as well as preinstalled content, you can trade in one grandMA video dongle per MA VPU basic, plus or pro. Please contact your local dealer for details.

Launching the MA Video Processing Units (VPU) there is no more split between software and hardware. The dongles are discontinued – only the full package including dedicated hardware is available, the dongle is "built-in". For sure, everybody who invested into dongles will benefit of the new VPU functionality by installing the latest VPU release software.

With the MA VPUs there is no “open” operating system with any kind of default driver – they are all improved to serve the best result for the VPU. Also the decoder has changed for best performance results. That means – however – that new content is needed and the new one is based on MPEG-2. With any MA VPU there is some Gigabyte of content pre-installed.

However, we also offer an exclusive MA-Content-Package from showfootage.com - which offers you over 500 free selectable clips. To be precise: from a huge content library of renowned designers you can download 320 SD clips, 120 HD720 clips and 100 HD1080 clips. This makes the MA-Content-Package the ideal way to individually extend the pre-installed content of the MA VPU. Please check http://www.malighting.com/showfootage.html for further details.

From grandMA video to VPU. How to update your system:
After downloading the software from our webpage you just need to install it. The look & feel will be like the grandMA2 software. Then you need to download a new MPEG-2 decoder from Main Concept (link: www.mainconcept.com/site/prosumer-products-4/mpeg-2-22078/information-22089.html?L=0) and actually pay for it.

Should not be more than 49€. Attention: Keep the key number!!
From now on the software is fully functional. Please be aware of the fact that old shows from grandMA video cannot be loaded anymore. Therefore the new showfile is absolutely compatible to grandMA2. All custom-made content might need to be re-rendered into MPEG-2.

As a former user of grandMA video you will easily discover the new functionality of the MA VPU software. Some functionality has changed as well as some naming. Please refer to the documentation like the online manual to learn about it. If you use the VPU software with an external dongle (old grandMA video) you will have the same performance like a MA VPU plus – in other words: there are no restrictions!

Major changes in a rough overview:

- Decoder and codec has changed! From QuickTime to MPEG-2! You need to buy it (with the VPU it is included)
- Old shows are obsolete
- Old content needs to be re-rendered
- New fixture types for VPU

What else to expect for the future?

- We are working on an integrated Pixelmapping – means the Pixelmapper of the VPU and the Bitmap-effects-engine will be “married” at a certain point. We divide Pixelmapping into two parts: PM by Art-Net (like it was before) and PM by MA-Net (the new style of PM).
- At a certain time 3D will be able to display the result of a VPU output for better preprogramming.
- 3D Keystone will get a real warping functionality

We hope that this document provides what you need to know about the transition from grandMA video to the VPU software. The grandMA video software ends with the first release of the MA VPU Software. For any further information please get in contact with us – we are glad to assist you!

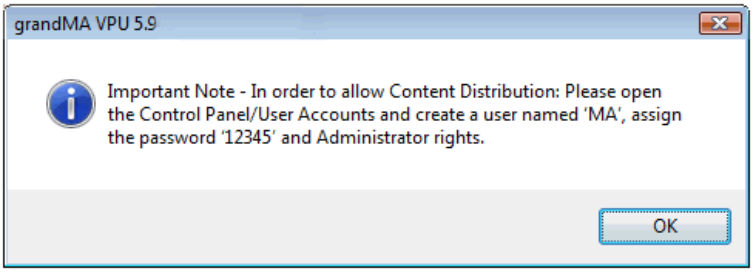
2 Installation and Maintenance

The actual version of the application can be downloaded from the MA Lighting support site: www.malighting.de

Note (for Dongle Users only):
Please extract the downloaded file into a temporary folder and run the 'Setup' (gMA-VPU_[n.nn][n.n]_v-n.nn.exe) program.

You should have administration rights to install the program.
To work with MA VPU without administration rights you have to arrange the administration rights by the administrator on the installation path e.g.:
C:\Program Files\MA Lighting Technologies\MA VPU Software

If you want to distribute the content you must create a user named 'MA' with the password '12345'. This user should have administration rights on the locale machine!
The installation shows an alert to remember to this fact:


grandMA VPU 5.9
Important Note - In order to allow Content Distribution: Please open the Control Panel/User Accounts and create a user named 'MA', assign the password '12345' and Administrator rights.
OK

2.1 Startup of VPU

This chapter describes the startup of the VPU application. MA VPU machines are already configurated with this mechanism so the users don't have to take care about this.

Note (for Dongle Users only):
To realize an auto start of the VPU application a startup software 'VPUShell.exe' is installed on the target machine at:
C:\Program Files\MA Lighting Technologies\MA VPU Loader

This program is called by the operating system (e.g. Windows Vista) in startup of the VPU target machines. It takes care of the right program location and paths.

2.2 Software Update

To install the software updates on the VPU choose File / Update Software or Setup-Update software in the touchscreen to open a dialog to select the wanted update file. When using the internal software update, then your file should have a “@” in the name and is called a “silent” installer version. An example could be gMA-VPU_[1.3.0.0][6.1]_v2.40@.exe.

Navigate to the wanted folder and select the file. Click OK to proceed. After the installation is finished, the VPU software will restart and the new version is automatically starting afterwards. Check the version number in the VPU itself to make sure that the installation was successful

2.2.1 Service Packs

The current version demands minimum Vista SP 2 and XP SP 3 (media PC/Dongle Users) and detects the SP when booting the VPU or starting the software. Follow the steps mentioned in this warning and please update your system!

Session Name
vpu
Session ID
1
Show
gitter freitag
Warning
We highly recommend Service Pack 2 when using Windows Vista
If you ignore this warning, this may cause malfunction or
undesired software behaviour.
1. Download the Service Pack.exe file by following the Link on the MA
Lighting website (http://www.malighting.com/support.html)
2. Copy this file to USB and insert into the VPU
3. Click "Install Service Pack" and browse for Service Pack file
4. Follow the steps in the Service Pack Wizard
5. Done
Install Service Pack
Ignore this Warning

2.3 Backup

MA VPU is equipped with Acronis ® backup software (Not for dongle users of former grandMA video).

Note: This manual describes Acronis 2010.
VPUs basic with serial numbers < 2 and VPU plus with serial numbers < 45 are equipped with Acronis 2009. Basically the use of Acronis 2009 is the same as Acronis 2010. Backup with Acronis 2009 is described in Manual_gMAVPU3.40.

Machines from Serial Number #87 on operate Windows 7. They are equipped with an USB stick at the VPU backplane to start Acronis. You can do this via pressing F12 during startup.

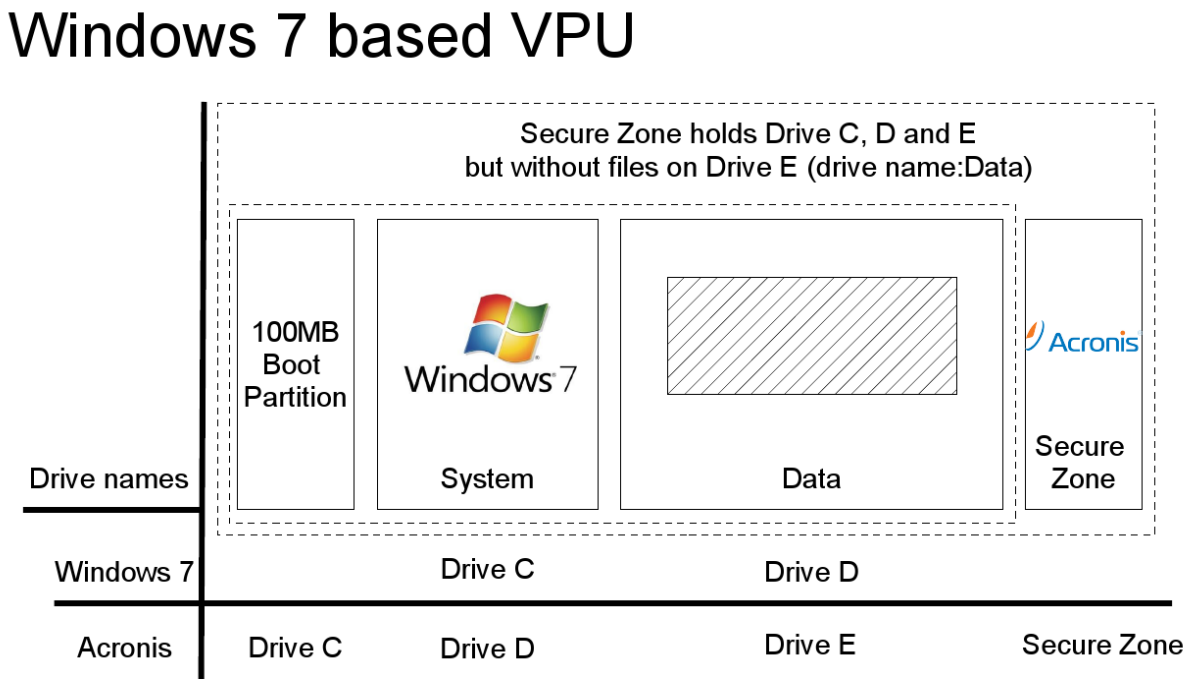
2.3.1 Handling backups with the VPU

MA Lighting keeps the factory settings of the Windows operating system with all factory default settings on a hidden part of the hard disk of the VPU. This is useful for you to recall this data whenever you encounter problems in the VPU software that cannot be solved by a software update. You can use Acronis as well to store and recover your own backups.

Note: Do not store or delete any files in the Acronis Secure Zone!
This is your lifesaver whenever it gets serious! The Secure Zone shall only be used to store 1 factory default file!

Your images can be stored on Drive D of the internal hard disk or on any external storage device that holds enough space to store your data. You should start Acronis from the Acronis Startup Recovery Manager. This means that you should restart the machine and press F11 (or F12 on VPUs > #87) during boot.

In Windows 7 (VPUs with serial numbers from #87) the partitioning of the harddisk changed. This is shown in the following image:

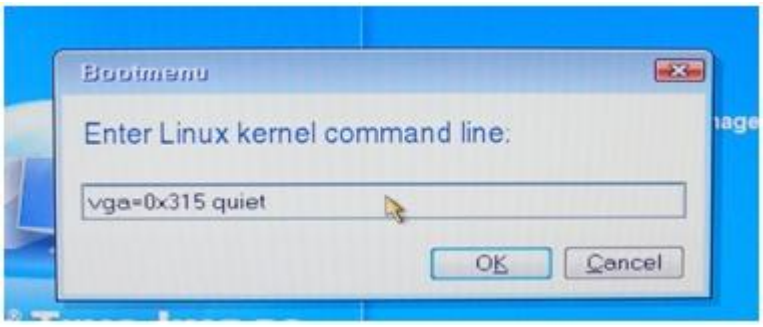


2.3.2 Start Acronis on VPUs with serial Numbers up to # 86 on

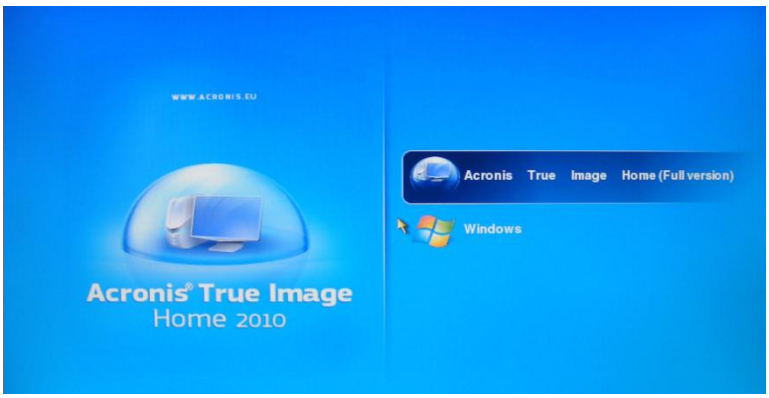
VPUs with serial numbers below # 86 are based on Windows Vista. Restart the machine and press F11 during Boot. This will lead you to the Acronis Start Menu. Press F11 again to open up a “Boot Menu” window to enter parameters:

Sales, Service and Support:
MA Lighting International GmbH
An der Talle 24-28
D – 33102 Paderborn, Germany
Phone: +49 52 51 68 88 65 10
Fax: +49 52 51 68 88 65 88
E-Mail: sales(at)malighting.com
Manufacturer, R&D:
MA Lighting Technology GmbH
Dachdeckerstraße 16
D – 97297 Waldbüttelbrunn, Germany
Phone: +49 931 49794 0
Fax: +49 931 49794 29
E-Mail: info(at)malighting.com
MA Lighting Emergency Hotline: +49 5251 688865 99
Please note, this 24/7 hotline is strictly for emergency cases –
for people being in trouble out in the field.
Enter F11 to enter ACRONIS Backup
Bios F7 AHCI
Enter TAB to show POST screen DEL to enter SETUP F12 to enter Boot Menu

Stood in January 2010, you have to force the graphic card to do 800x600 to work correct with the internal screen on a VPU Plus. Otherwise you will see graphical artefacts and not readable fonts!
On a VPU Basic it is not intended to put any Boot menu parameters into this line. If you pressed F11 and the Boot menu window comes up:

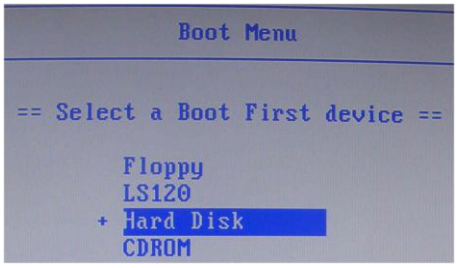


Enter this complete line (also written identical!) (only in Acronis 2010):
vga=0x315 quiet and press OK.
You will then be at the start screen of Acronis. Choose “Acronis True Image home” to proceed:



2.3.3 Start Acronis on VPUs with serial Numbers from # 87

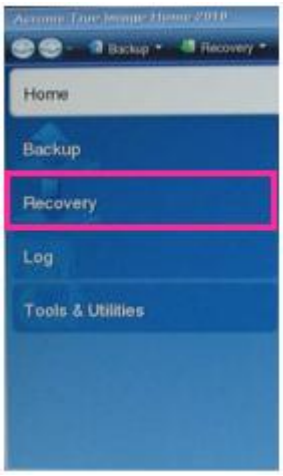
VPUs with serial numbers from # 87 on are based on Windows7.
They are equipped with an external USB stick that you will find at the backplane of the VPU.
To boot from USB media press F12 during startup. This leads to the Boot menu. Select the boot device ‘Hard Disk’ and then the USB flash drive as shown:

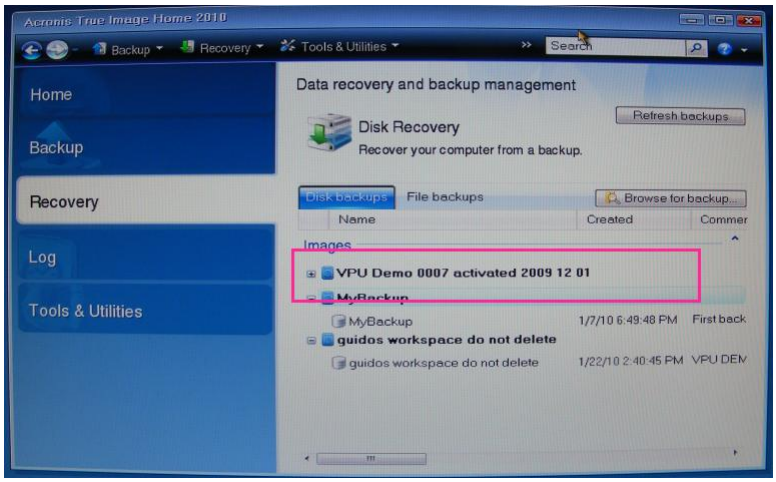


You will then be at the start screen of Acronis.

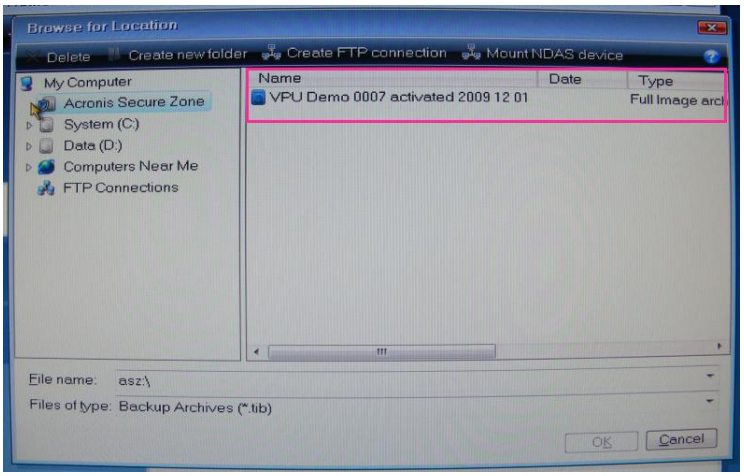
2.3.4 Restoring an image with Acronis

In Acronis click on “Recovery”. This will list you all available backups:



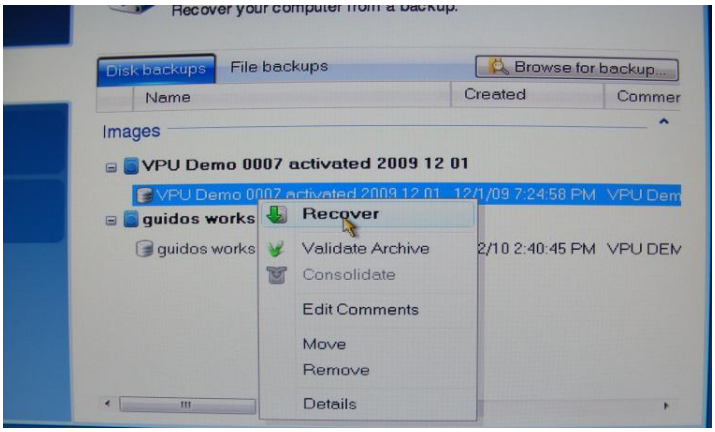


If you are restoring an Image from an external memory, click browse for backup to select the image from your memory. In some cases the Secure Zone image is not listed here automatically. You can rather click the „Refresh Backups“ button or recall the image out of the Secure Zone again if necessary.
Select your drive and image and click OK:

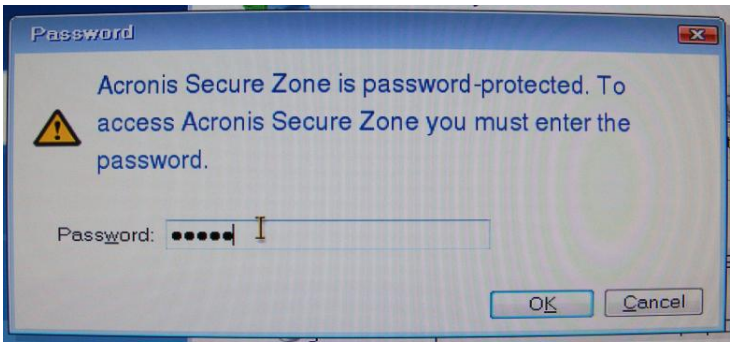


If you are restoring from Acronis Secure Zone do the same as described above, your Secure Zone is listed in the location tree as well. Select the file and click OK.

Now you see the wanted image listed.
A right click with the mouse on the image will give you several options.
Choose recover to proceed:

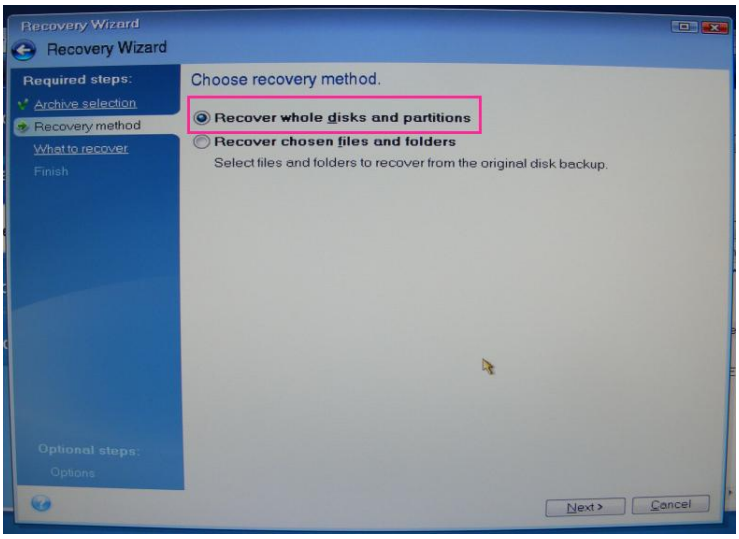


IF you are recovering from a secure zone file, then you will be prompted with a new window:

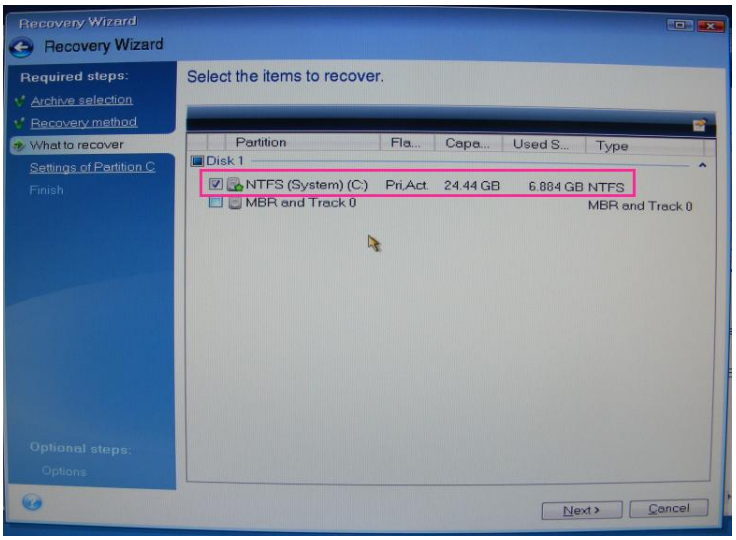


Enter: “12345” as the password and proceed by clicking on Ok.

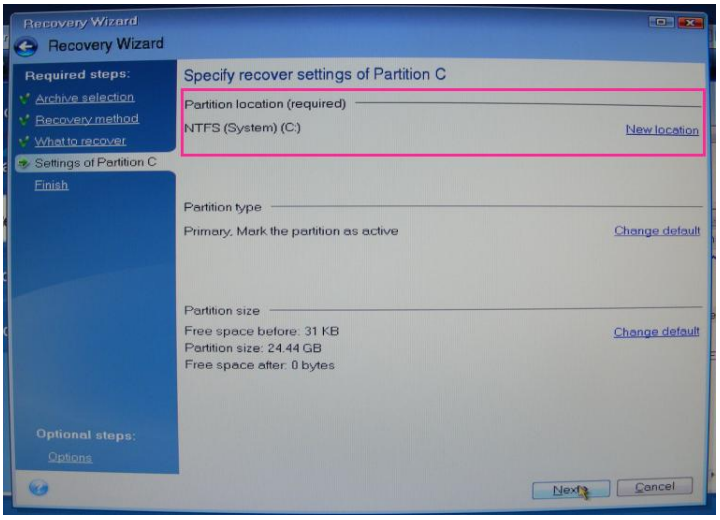
The next option is to choose whether to restore the whole partition / drive that may be stored in the file or only some files of it. In our case you may only want to restore the whole disk / partitions:



If your image does only contain one partition, you may see a picture like this in the next step. You should only choose to restore the partition, not the master boot record:



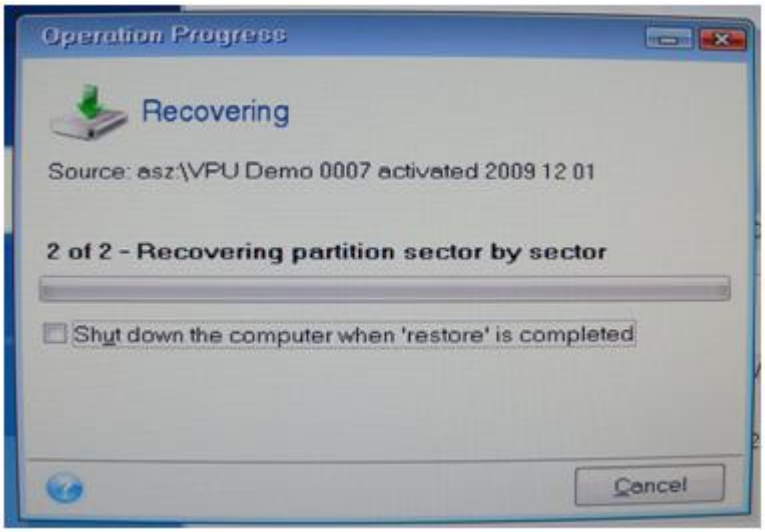
If you restore a complete hard disk, make sure that you select the whole disk including the Acronis Secure Zone:



Make sure to choose the right location (e.g. a secure zone file has always be recovered to System drive C:). If it is not the wanted one click on new location and choose the right place.

If you want to restore a complete disk, make sure to choose the right hard disk if your VPU does have more than one hard disk drives. Also check the right connection and naming of any external connected hard drive. If you are unsure, please contact MA Lighting to avoid any damage of your system.

In the next step you will see an overview of what you will restore. Click on proceed and start the recovery of the image:

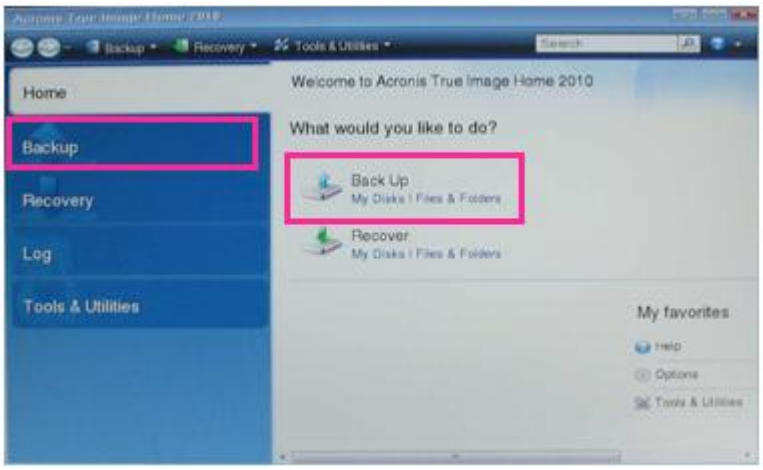

Operation Progress
Recovering
Source: asz:\VPU Demo 0007 activated 2009 12 01
2 of 2 - Recovering partition sector by sector
Shut down the computer when 'restore' is completed
Cancel

2.3.5 Storing an Image with Acronis

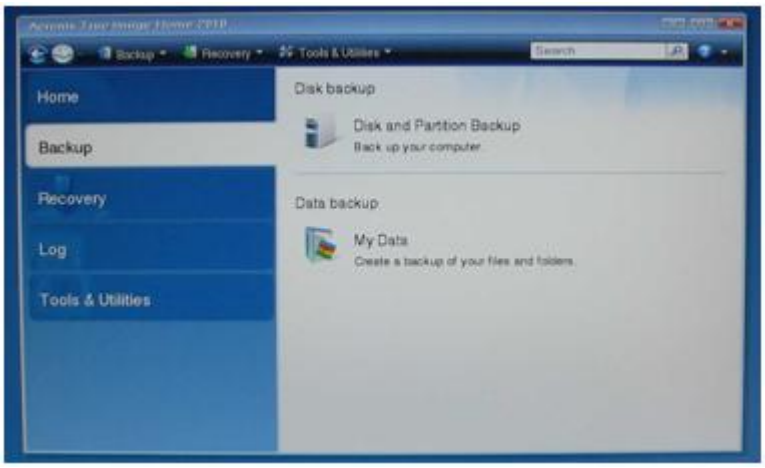
Since MA Lighting wants to give you the factory settings for trouble shooting never delete, change or store files in the Acronis Secure Zone.

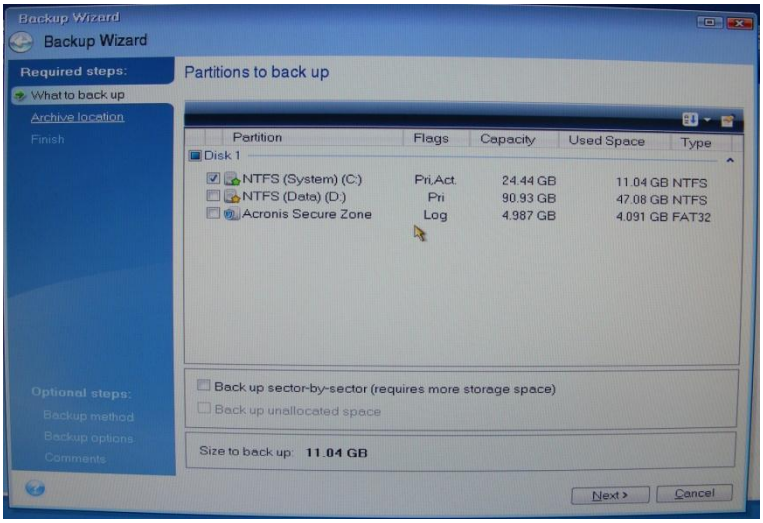
Keep in mind that a FAT32 formatted USB stick or hard disk can only handle files up to 4Gbyte. Otherwise you will have to reformat that device with the NTFS file system.

In Acronis choose the Backup option:

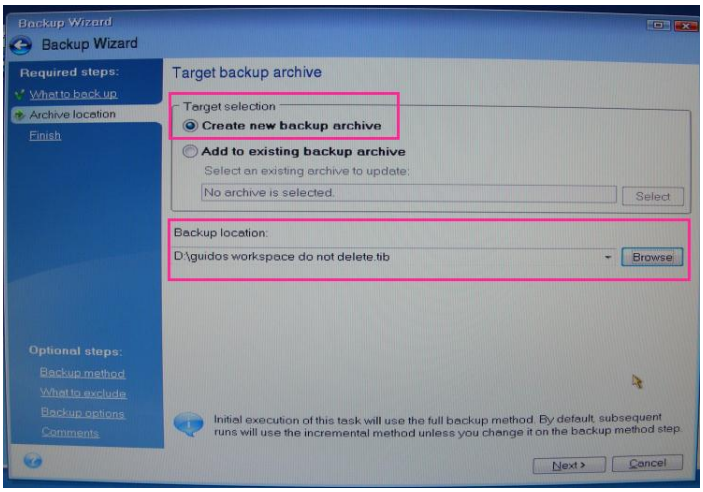


Normally you want to backup a complete partition so the next selection shall be “Disk and Partition” Backup:

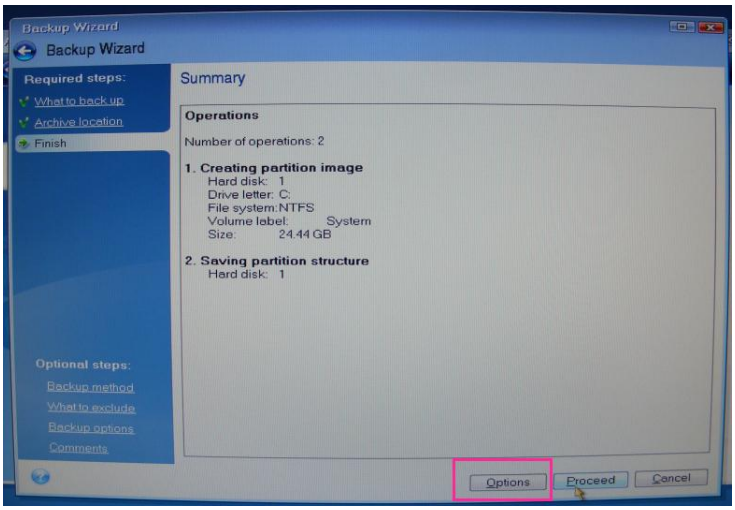




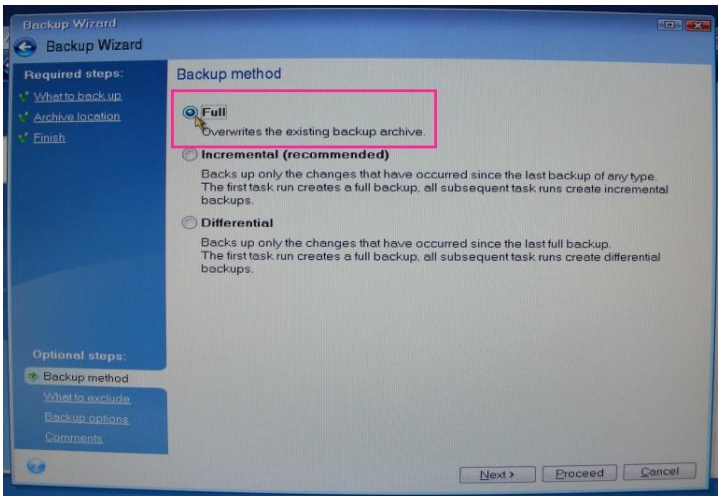
The next step is to define which partition or part of the disk you want to backup. If you want to write a backup of a single partition, then select the corresponding partition without the Secure Zone. If you want to do a complete System Backup, also include the Acronis Secure Zone. When everything has been set right, choose next to proceed:



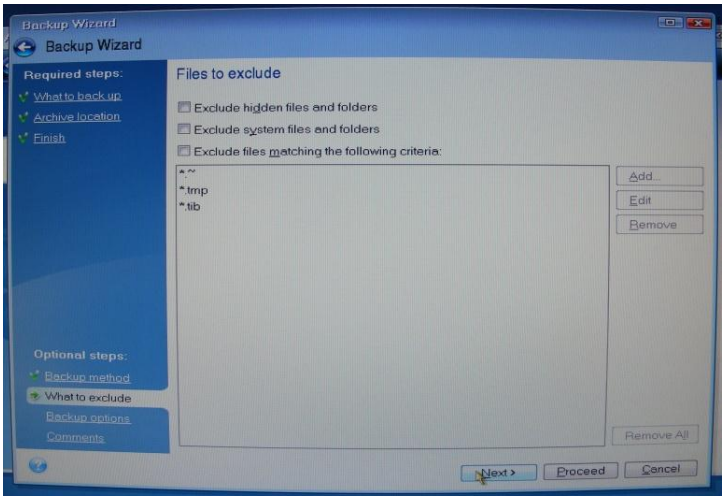
To write your image onto any memory you can choose the place to store.
Click on Browse to do so.
The file name should be conform with these definitions:
Name: “VPU XXX SN activated DD MM YYYY”
where XXX is the Type (BASIC / PLUS / PRO) | SN is the Serial Number e.g. 0004 for number 4.
Click on next to proceed.
In Acronis 2010 you could now directly proceed to write the image. However, it is necessary to choose “Options” to do further settings before writing the image:



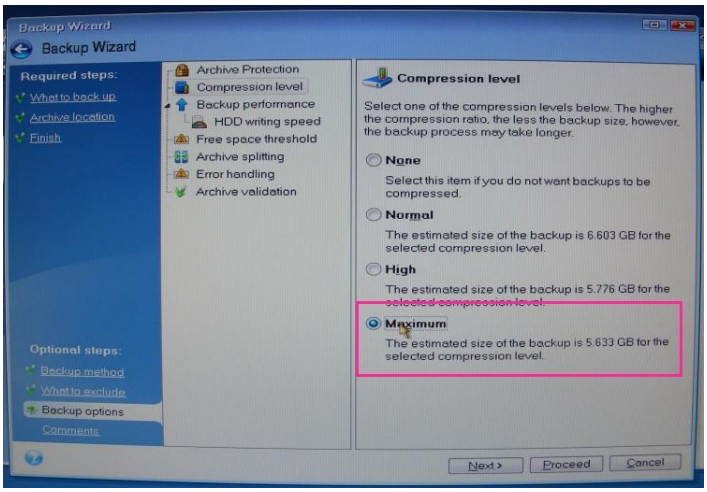
You have to choose “Full” as backup method:


Backup Wizard
Backup Wizard
Required steps:
What to back up
Archive location
Finish
Backup method
Full
Overwrites the existing backup archive.
Incremental (recommended)
Backs up only the changes that have occurred since the last backup of any type.
The first task run creates a full backup, all subsequent task runs create incremental backups.
Differential
Backs up only the changes that have occurred since the last full backup.
The first task run creates a full backup, all subsequent task runs create differential backups.
Optional steps:
Backup method
What to exclude
Backup options
Comments
Next >
Proceed
Cancel

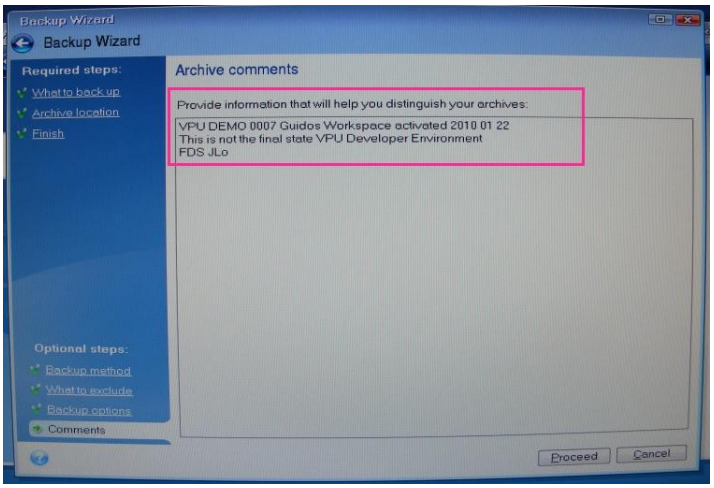
No files shall be excluded in the image so do not click any of these options in the next step:



Choose the maximum compression level. When storing images for your own purpose or in a normal backup situation you can lower the compression level to normal to speed up the process:


Backup Wizard
Backup Wizard
Required steps:
What to back up
Archive location
Finish
Archive Protection
Compression level
Backup performance
HDD writing speed
Free space threshold
Archive splitting
Error handling
Archive validation
Compression level
Select one of the compression levels below. The higher the compression ratio, the less the backup size, however, the backup process may take longer.
None
Select this item if you do not want backups to be compressed.
Normal
The estimated size of the backup is 6.603 GB for the selected compression level.
High
The estimated size of the backup is 5.776 GB for the selected compression level.
Maximum
The estimated size of the backup is 5.633 GB for the selected compression level.
Optional steps:
Backup method
What to exclude
Backup options
Comments
Next >
Proceed
Cancel

In the last step before actually writing the image make sure to add some comments:

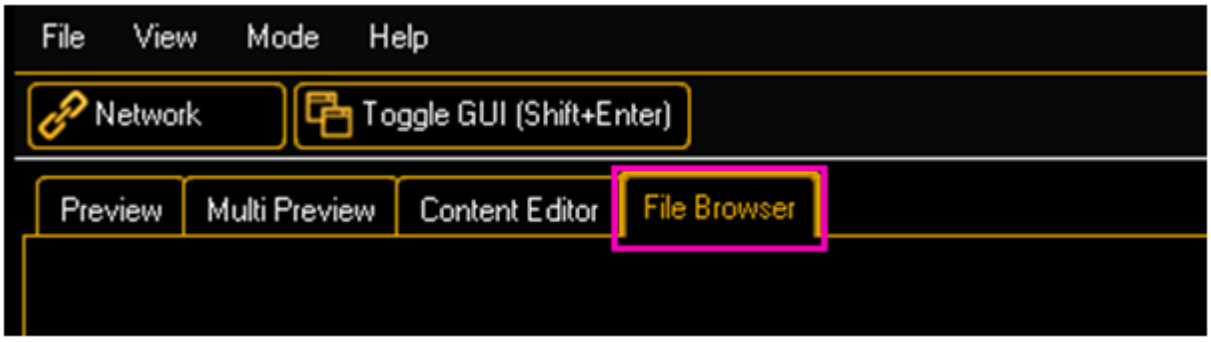


VPU XXX SN activated DD MM YYYY
where XXX is the Type (BASIC / PLUS / PRO) | SN is the Serial Number e.g. 0004 for number 4. This is identical with the file name for the created backup.
After inserting these entire information click on proceed to start the backup. You should always get a positive message at the end of the process. If not you should definitely check what went wrong.

2.3.6 Backup the VPU content after shipment

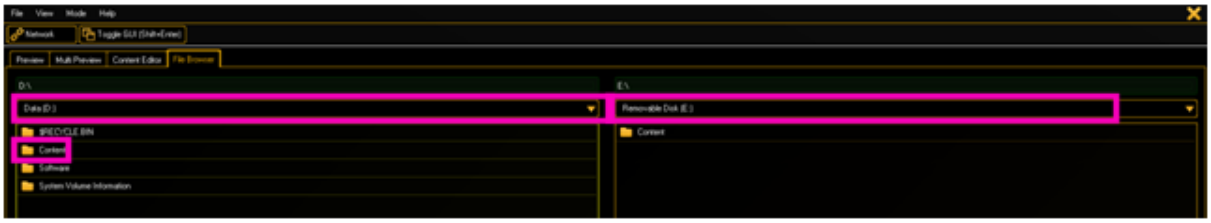
After unpacking the VPU Unit, the first thing you should do is to make a copy of the delivered content onto any type of USB storage device. This can be a USB stick or a USB hard disk with minimum 18 GByte free space.

This should be done by opening the file browser in the VPU software and by copying the complete content folder of drive D to your USB device. Just make sure that you connect your storage device before you switch to the internal file browser of the VPU because otherwise it may not be listed as a possible option. In the application click on the file browser tab.



If you are connected to a session (this may happen automatically if you are in grandMA2 mode and have a valid MA-Net2 connection to a console) a popup window and warn you that you will lose your session connection when entering the file browser. Click yes to proceed.

In the file browser window you can choose between two storage locations and drives. You can choose your storage device / hard disk partition by clicking on the dropdown menu to get a list of all available drives.



In our case we want to copy the folder “Content” from drive D to your USB storage device. So on the left side you choose drive D and on the right side you choose your USB device, in this case drive E with the name “RemoveableDisk”.

To do so, click on the folder on the left side and Drag&Drop it with a mouse to your drive on the right.

A new dialog will prompt you before you start. If the folder already exists, you can enable the option “Overwrite”. The actual copy process begins when you click the “Start Copy” soft button.

After the copy process is finished the copy process window will close and you will be returned to the file browser window.

You can now disconnect the external storage device by unplugging the USB cable.

To make sure that you really copied all of the data, connect your storage device to an external computer and check the size of the “Content” folder on it.

It should look like this:

Type: File Folder
Location: D:\
Size: 17.3 GB (18,643,731,842 bytes)
Size on disk: 17.3 GB (18,644,258,816 bytes)
Contains: 231 Files, 6 Folders

2.4 Access VPU via Network

To access the VPU over the Network, make sure your computer is in the same range as the IP address that is assigned to the Ether 1 device in the VPU.

You can use the 192.168.0.xxx range since this is also necessary for a valid MA-Net connection.

In your computer open a windows explorer window and type the IP address of your VPU as shown below:

A popup will show up and ask you to enter the user and password necessary to access the VPU.
User / Benutzername: “MA”

Password / Kennwort: “12345”

Then you can transfer data to the content or the software folder.

You have access to the complete partition d:\.
The default folder for content is d:\content.
The software folder is used to transfer software updates to the unit via Ethernet connections.

2.5 Version of grandMA desk or grandMA onPC (off-line)

You can determine by means of the version number of MA VPU if the software version fits to the software version of the desk or off-line.

MA VPU version number can be determined via:

Filename of the setup:
gMA-VPU_[{**GMA2-Streaming**}][{**GMA1-Streaming**}]_v{VPU-Version}
Splash screen (apperars while startup)
Info box (Menu – Help – Info)

Example: grandMAVPU_[**0.900**][**6.1**]_v1.34

0.900	GMA2-Streaming Version	This number should **correspond to** the **grandMA 2** onPC streaming version
6.1	GMA1-Streaming Version	This number should **correspond to** the **grandMA 1** onPC streaming version
V1.34	Version of MA VPU	

2.6 IP Addresses

IP addresses are what allow the internet and most modern networks to work. It's a way of identifying a computer by a unique set of numbers (an IP address). An IP address is made up of a set of four numbers. Each number can have a value between 0 and 255.
IP adresses can be set via the network settings of the Windows system settings.
MA VPU has to be restarted if the settings are changed. New adresses are read with the restart of MA VPU.

Your PC and the console must have their respective IP addresses set up correctly.
The first three sets of numbers must be the same and the last set must be different.

For example:

GrandMA console IP address: **192.168.0**.5

PC with MA VPU IP address: **192.168.0**.10

To setup the IP address of the desk, please refer to the desk user's manual.

Note:
The default IP address of MA VPU is 127.0.0.1 (the local host address of the PC).
In this case MA VPU application can be connected only with the onPC application running on the same PC.
To work within the external network choose the network address e.g. 192.168.0.x.

The actual IP address
is shown within the Status Bar:.

You can change the IP address via the menu entry: 'File – Settings – Network'.

2.6.1 IP Address of the PC

Please note if you are already part of a network please check with your network administrator before changing your IP settings.

IP settings can be found at:
START – CONTROL PANEL – NETWORK CONNECTIONS (Windows XP)

START – CONTROL PANEL – NETWORK AND SHARING CENTER (Windows Vista)

2.6.2 Artnet IP Address

The Artnet Standard needs a class A IP address beginning with 2. for example 2.2.2.2 and a subnet mask 255.0.0.0.

This address can be added via the Windows dialog Advanced TCP/IP Settings.

Further information about the Artnet protocol under:
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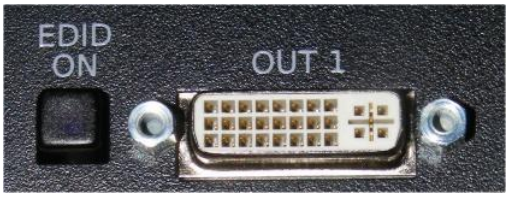
2.7 EDID Manager

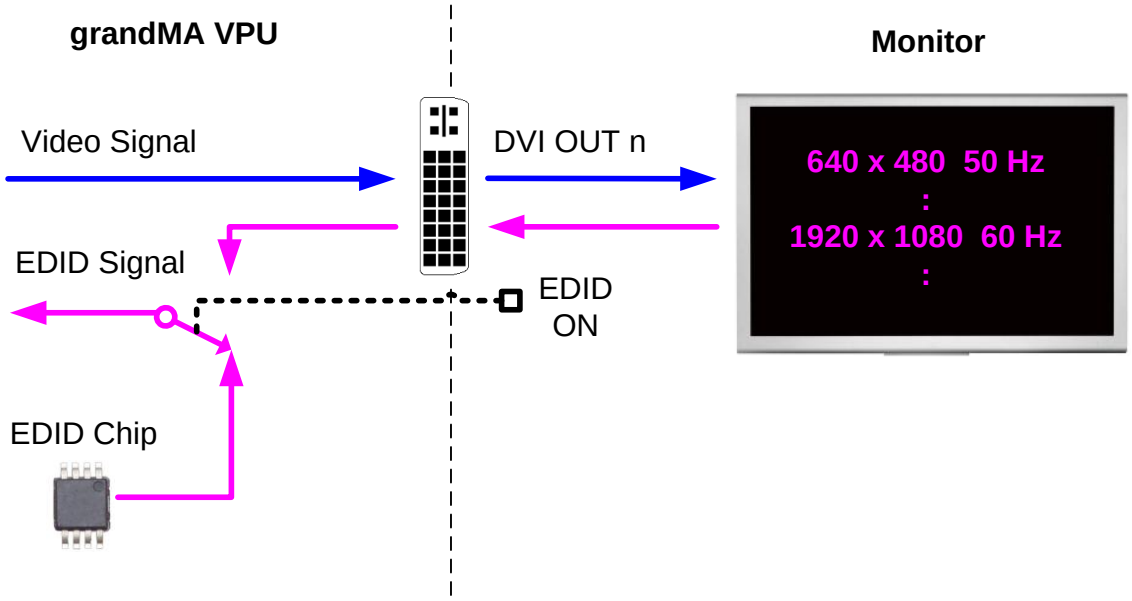
Extended **D**isplay **I**dentification **D**ata exchange is a standardized means for a display to communicate its capabilities to a source device. It enables the VPU to know what kind of monitor is connected. The EDID includes manufacturer name and serial number, product type, phosphor or filter type, timings supported by the display, display size, luminance data and (for digital displays only) pixel mapping data.

Unfortunately some LED walls offer no EDID data, so the VPU software cannot offer the correct resolution and refresh rates. Or if a monitor is reconnected the right resolution and refresh rate has to be set again.

To avoid these troubles the DVI outputs of the VPU have been equipped with additional hardware. An EDID Chip offers the common resolutions and refresh rates to the VPU hardware.



The switch near the DVI OUT connector lights **blue** if EDID is simulated.



Note:
If VPU is turned on and only output 2 is connected (EDID signal found) this output gets the logical output 1. If now a second monitor is connected to output 1 (or EDID 1 is switched on) this will be assigned to logical output 2. This situation can be undone if VPU is restarted with only on monitor (or EDID signal on) on output 1.

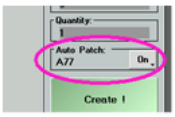
The EDID chip offers the following DVI resolutions and refresh rates. Other values are invalid:

H	V	Refreshrate Hz
640	480	50
640	480	59
640	480	60
720	480	59
720	576	50
800	600	50
800	600	59
800	600	60
1024	768	50
1024	768	60
1280	720	24
1280	720	25
1280	720	29
1280	720	30
1280	720	50
1280	720	59

H	V	Refreshrate Hz
1280	720	60
1280	800	60
1280	1024	50
1280	1024	60
1400	1050	50
1400	1050	60
1440	900	60
1600	1200	59
1600	1200	60
1680	1050	59
1680	1050	60
1920	1080	24
1920	1080	25
1920	1080	29
1920	1080	30
1920	1080	50
1920	1080	59
1920	1080	60

3 Communication with the grandMA Desk Series

Notice that the DMX channels have to be ‚patched' to communicate with MA VPU.



The simplest way of ‚patching' is to set the switch ‚Auto Patch' in the dialog ‚Create New Fixtures or Channels' to ‚On' at the desk or the 'on PC'.

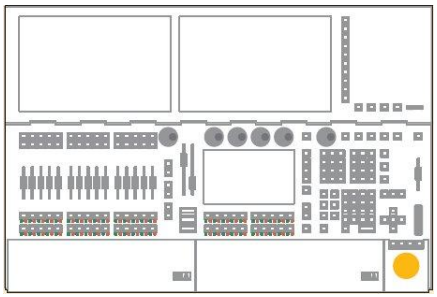
3.1 Connection with the grandMA desk

Please make sure, that the program version of the grandMA desk meets the specifications described in: *2.5 Version of grandMA desk or grandMA onPC (off-line)*

For communication you have to connect the VPU with the grandMA console or another PC running the grandMA onPC.

You can do this directly with a patch cable with two RJ-45 connectors or via a network switch.

grandMA Console



RJ 45 Cable or Switch

MA VPU/PC

If you use a network with a switch, connect the PC with a regular patch network cable to the switch.

Connect the cable to the desk.
Start the desk and load a video show
Start the grandMA application and join the session or invite the video application from the desk

The application connects to the desk and receives the data of the current show.
If you do not get a connection to the desk, make sure that MA VPU has the right IP address as described in '2.6 IP Addresses' and that the corresponding mode: grandMA 1 or grandMA 2 accurate.

3.2 grandMA 1 or grandMA 2 mode

MA VPU supports series 1 and series 2 consoles. To set right the mode, start the application via double-click at the icon (Dongle users only, VPU users will see VPU Shell):

MA VPU starts in the last used mode (grandMA 1 or grandMA 2 mode).

The actual mode is displayed in the statusbar.

To switch between the mode select the menu entry ‘File – restart with randMA ½ network’. The application restarts in the next mode.

3.3 Connection with the grandMA onPC (off-line) software

Please make sure, that the program version of the grandMA onPC software meets the specifications described in: *2.5 Version of grandMA desk or grandMA onPC (off-line)*

Start the grandMA onPC and load a show (Backup Load Show)
Start a new session at the grandMA onPC (MA Network Connections ‘Start New Session’)
Start the MA VPU application

MA VPU searches for a running grandMA onPC session with a unique ID. If the session is found MA VPU connects automatically with this session and loads the current show.

If you do not get a connection to the desk, make sure that MA VPU doesn’t run a master session.

3.4 Connection States

When you launch MA VPU it tries to connect to a session with the same ID.
The four possible states of the connection are indicated by the heart in the status bar. The blinking of the heart indicates the communication between the desk and MA VPU.

Heart is broken and red:
No connection to a session established

Heart is blinking green:
MA VPU has joined a session as slave

Heart is blinking blue:
MA VPU is the master of a session. The creation of a session with MA VPU can be used to transfer all data of a .gvs or .gz file (MA VPU 1 or 2 formats) to a desk or onPC. If the loading is completed, the desk automatic becomes the master and MA VPU gets the slave.

Heart is blinking yellow (grandMA 1 only):
MA VPU has joined the session in the 'Sniffer mode' , this is a simple receiver mode.
In opposite to the slave mode no session data will be exchanged with the desk.

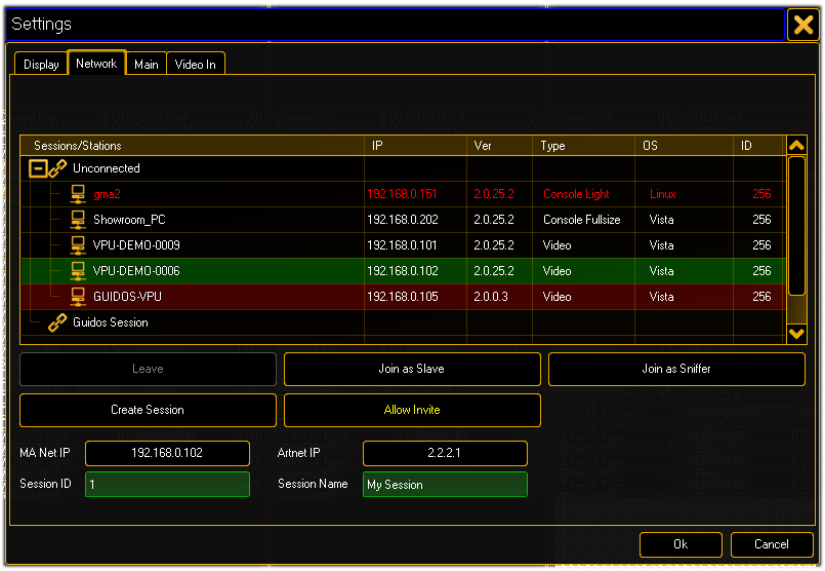
ATTENTION: With the start of a new session (Create) the session founder overwrites all data of the other members. I.e. if a new session is founded by the MA VPU **all** data in the desk will be overwritten!

If more than one console, visualizer or onPC editor is connected to the network the connections to the equipment will have to be properly assigned.

The communication between consoles, visualizer, VPU applications and onPC editors takes place in sessions.
A session has only *one* founder. This is e.g. the master. On connection the founder transfers its data (fixture types) to the slaves.
From then on, all session members are synchronized and have equal rights. If a fixture is edited in the slave the change is reflected in the master and vice-versa.
Devices not assigned to any session are not in the list.
If you press the 'Invite Station' Button you get a list of these MA devices.

Series 1 specification:
A Session always has one master and up to 31 Slaves, i.e. max. 32 devices. For example a slave can be another MA desk, an NSP, a grandMA onPC application, the grandMA 3D visualizer or a MA VPU station. In the 'Sniffer mode' more VPU sessions are possible because similar to the Artnet protocol a VPU station is only receiving data.

Series 2 specification:
A Session always has one master and up to 199 stations.



The network configuration can be managed by the ‚Settings Network' dialog.

Remark: If the session entry appears in red, the streaming version is wrong. You have to update the software.

The upper part of the dialog shows the active sessions and their members in a tree view. MA VPU is marked green.

Leave (Session):
Leave the session. Disable ‘Allow invite' if you don't want to be invited automatically

Join as Slave :
Join the selected session as a member (usually as slave).
After that data of the desk is transferred to the MA VPU.

Join as Sniffer:
Join the selected session as a sniffer i.e. the VPU application is only receiving data similar to an Artnet receiver application. If you change settings in the Video application no data is sent to the desk i.e. inserting of content from the desk is not possible in this mode.

Create Session:
MA VPU creates a new session as master. This function is used for example if a show already exists. The show with all data is sent to the slave. If the loading is completed, the desk automatically becomes the master and the VPU station gets the slave.

Invite Station: (grandMA 1 only)
Opens a dialog showing all connected MA members (desks and onPC) in the network.
You can invite new members via the dialog.

Settings:
MA Net IP:
Use this listbox to choose an IP address for network communication. If there is more than one IP available (e.g. multiple network cards installed) select the IP address which is linked to the grandMA desk.

Artnet IP:
Use this listbox to select an IP address for the Artnet communication of the Pixelmapper (receive data only).

Session ID:
Every session in the grandMA network has a unique ID.
Only members with this ID can take part in this session.

Session Name:
Input or display for the name of a session.

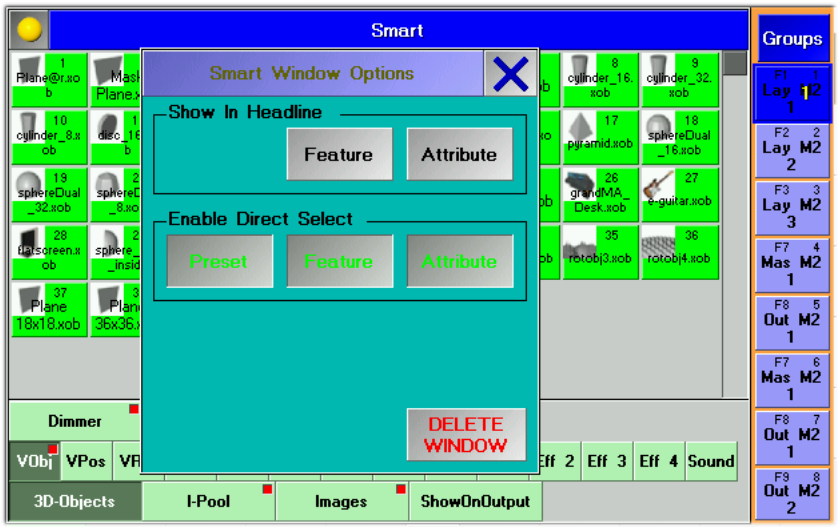
3.5 Preferred Operation Mode (Screen Layout MA 1Series)

To get a direct access to the channel sets of the fixture layers we recommend the smart view. The “Smart View” offers a clearly arranged summary about the layer content and objects. All important functions can be accessed via short keys.

To configure a ‘Smart View’ follow the following instructions:

Click on the empty touch screen to call the “Create a Window” dialog
Select the “Smart” button

In the upcoming “Smart” window press the yellow button left above:

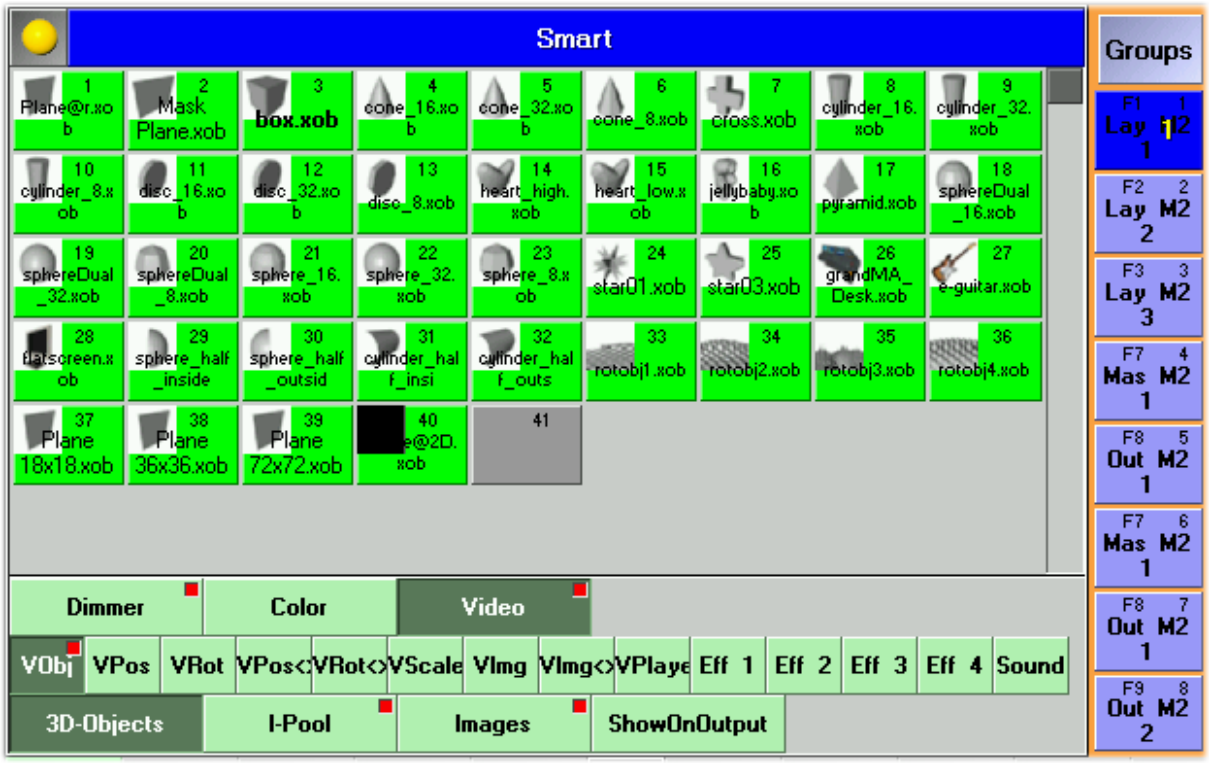


In the ‘Smart Window Options’ dialog select the ‘Enable Direct Select’ buttons
‘Preset’ + ‘Feature’ + ‘Attribute’

To create the “Group” buttons carry out the following instructions:

Press the “Setup” key at the desk
Push “Auto create” at the touch screen
Set the “Select” entry in “Video Layer” and “Video Master” to “Yes” and press “Create single Groups only”
Change into the “Smart” view and resize the smart window to get space for the group buttons
Click into the blank area and select “Groups” in the upcoming dialog

The result should look like this:



4 Data management

This section describes how data is managed by the desk and MA VPU.
Desk and VPU can work independently. Each package can be operated standalone. If they are connected in a MA network session the desk gets the master and the video application becomes the slave of a session. Data changed within the video application is transferred to the desk and vice versa.

4.1 Master slave

The MA console or onPC is always the master of a session.
Only if the MA VPU is started as standalone it can be the master. If a desk is connected and a session is started within the VPU application the show file will be transferred to the desk and then this becomes the master and the VPU the slave. So the synchronization of desk and video data is guaranteed.

In **grandMA 1** mode you can directly invite the console from VPU after creating a session from VPU.
In **grandMA 2** mode you still can create a session from VPU but you need to join this session from the console.

4.2 Principle function diagram

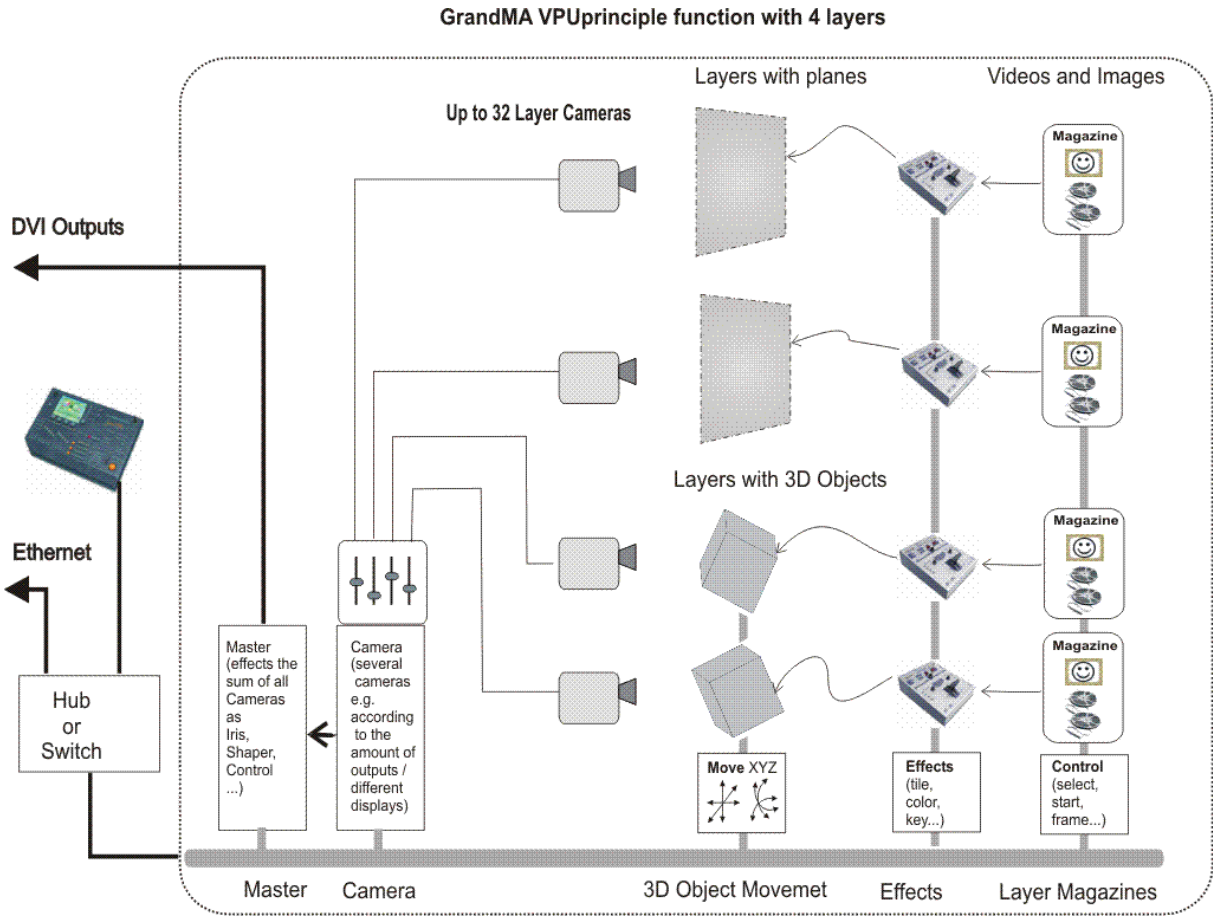
The following pattern demonstrates how data is processed.

If you connect the MA VPU to a grandMA desk you can compare the result with some slide projectors remote controlled by an MA desk.
In contrast to a slide projector the slides are not projected on the screen. The screens or 3D objects are active light emitters like monitors and can take the shape of any geometric form. This takes place on so called “Layers”. Each Layer output feeds a virtual camera.

The virtual camera outputs can be mixed up to a resulting video output.
Each layer has its own magazine containing emitting 3D objects.
Each layer has its own magazine containing videos, images and masks.
The number of 3D video layers can vary in dependence of the complexity of your show.
You can patch up to 32 layers.

If the MA VPU is invited in a session by the desk, layers behave similar to a fixture.
All layers have access to the same content pool.
The application receives the amount of layers and each layer magazine is assembled with several images and videos. These are indicated by their relative paths and names.
If a layer 3D object or the content of a magazine is changed within MA VPU, the changed properties are immediately taken up by the desk.
Several MA VPU applications are shown in several ‘Layers’ on the MA-desk.

The following diagram shows a principle structure with 4 layers.

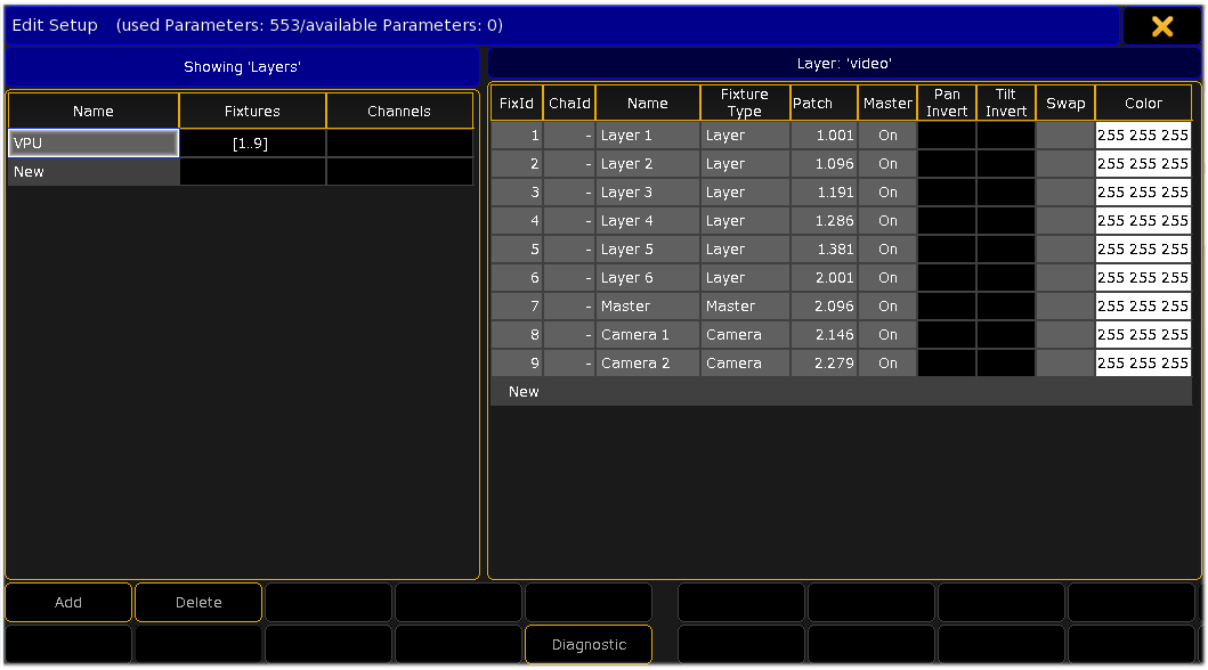


4.3 Layer properties

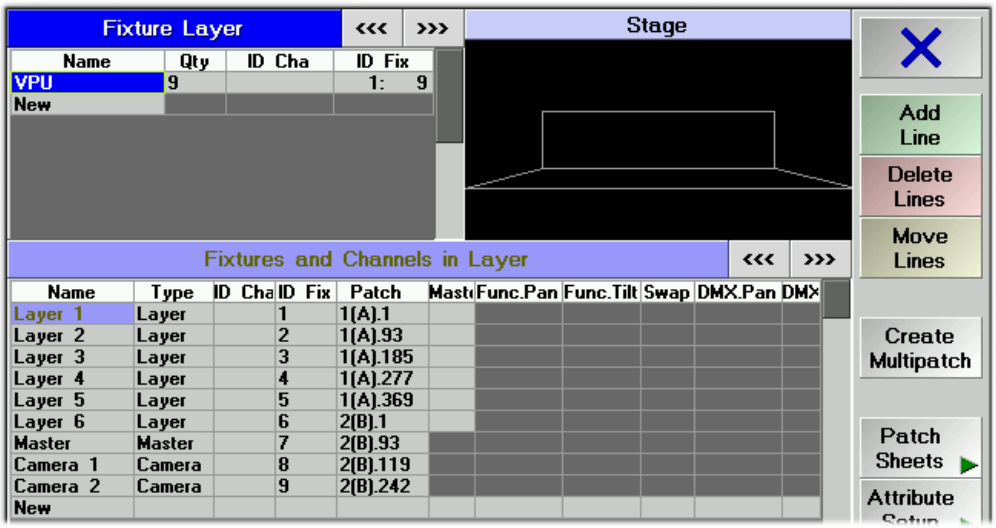
For a better overview shows can be arranged in Fixture Layers on the grandMA desks. E.g. the conventional lights can be separated from the multi functional fixtures and video engines.

For each MA VPU station an own Fixture Layer is created. This Layer accepts several Video Layers. These Video Layers can be combined to meet your requirements. In the following example the Fixture Layer with the name ‚VPU' contains 1 Master Fixture, 6 Video Layers and 2 Camera Fixtures (known as former VPU Output fixture):

grandMA2:



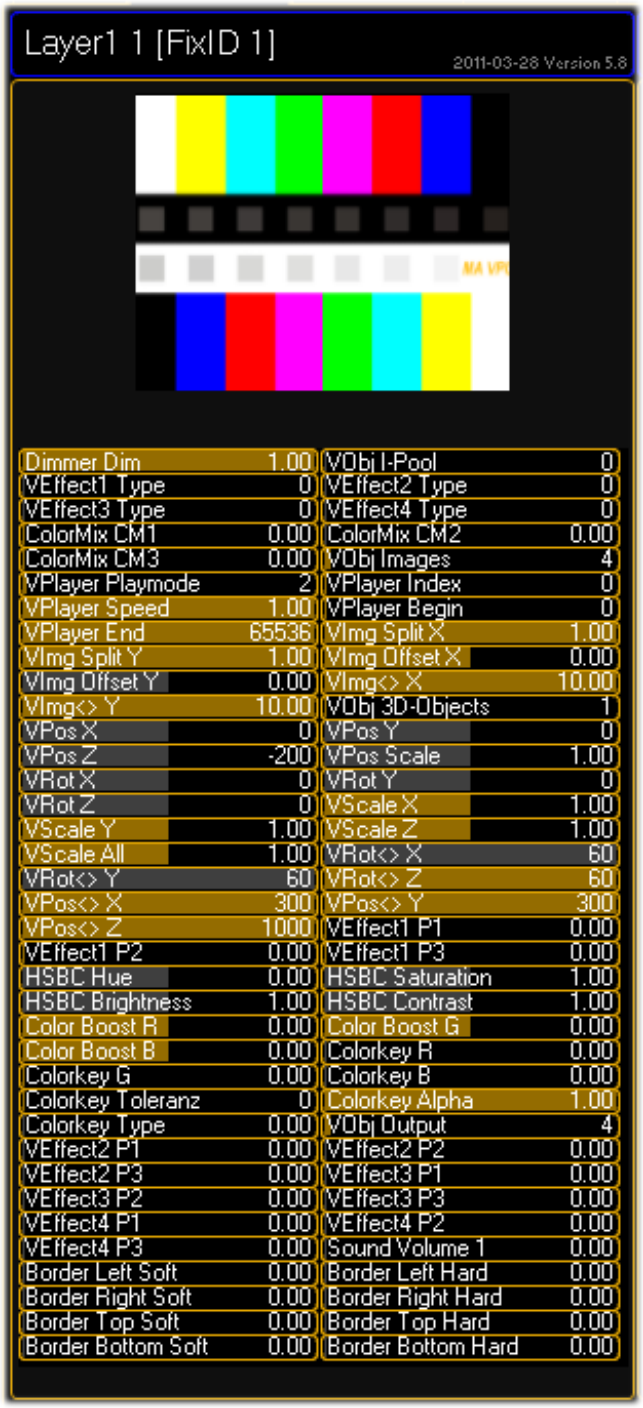
grandMA series 1:



Layers for a show can be arranged for your requirements on the desk. You can find them in the fixture library at the entry: ‚MA LIGHTING'.

The different Layer Types have the following meanings:

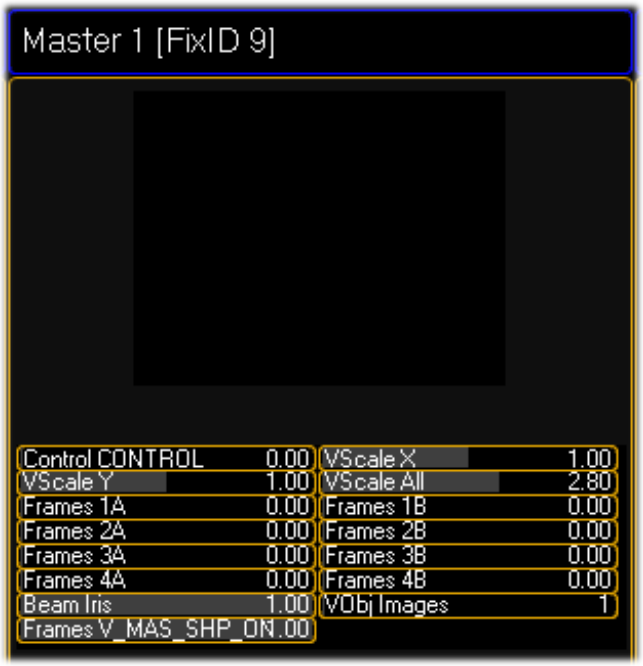
Video Layer:



This Layer can use several 3D Objects from the library to represent images and videos.
The content can be shown on several outputs of the graphics card.

A MA VPU application can contain several 3D Video Layers for images and videos. You can patch up to 32 layers to be more flexible in programming. Please note that you cannot run Video Clips on all these layers at the same time!

Master :



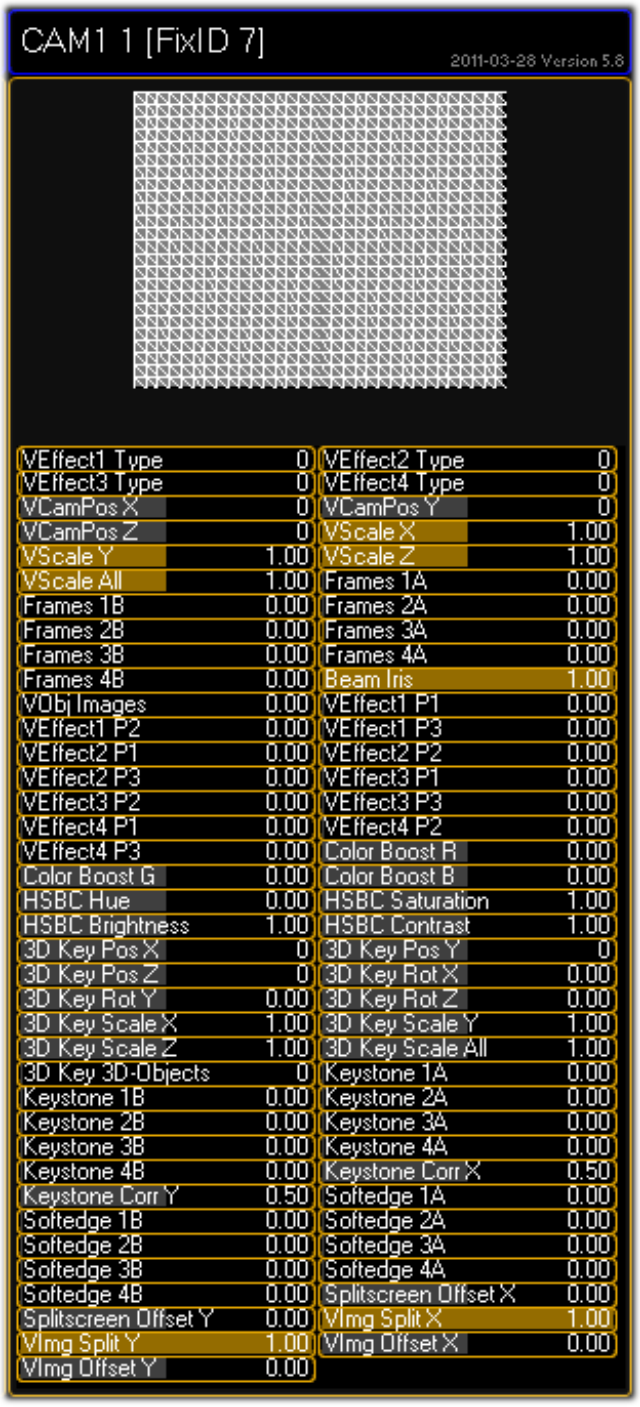
One MA VPU application can contain only one Master Layer. This layer represents a total view on all other layers. It serves the shapers, iris and scaling for all outputs.

A control channel offers for example

- remote controlled PC shut down

- Switch into Fullscreen View

Camera Layer (former Output Layer):



Each physical output (DVI) of the VPU needs one Camera Layer.

Additional to the effects in the video layers this fixture layer serves separate effects for each output and:

Shapers
Softedging
Keystoning

Note:
The name of the former VPU “Output Layer” has been changed to VPU “Camera”. This was chosen to hopefully make it clearer and easier for the users to understand the main concept of this fixture and to don´t mix up real DVI Outputs and Output fixture.
As known from grandMA video, with this version it is possible to freely assign a Camera to an Output. This was „Softedge ID“ in grandMA video.

Remember: Before this version the amount of Outputs (Camera) to patch into your show was limited by the amount of real DVI Outputs. So maximum 2. So when having a show with 6 monitors used as panoramic screens (one big screen composed of 6 screens) you needed to have 3 Layers „VPU“ in your show each consisting of Layers, Master and 2 Output fixtures. So you needed to handle 3 Fixture Layers but the setup could look much simplier. With the new function it is no longer necessary to handle different VPUs for this kind of widescreen application. One Fixture Layer with VPU Layers, Master and Cameras is enough and in the Settings - Display Dialog of the VPU you can tell the VPU witch Camera „View“ it should display.

4.4 Predefined Constellation

If a MA VPU application is started, and a new show is created via ‘File – New Show’ the application starts a show with the following configuration:

	Video Layer	Camera	Master	Description
NewShow	6	2	1	Will be loaded via ‚File – New’. Projection of 6 video layers

5 Several MA VPU applications in one grandMA show

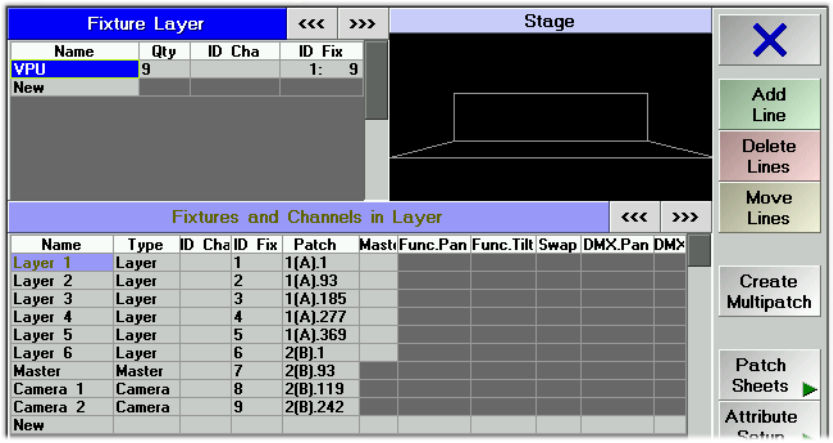
Several MA VPU applications can be operated via one desk simultaneously.
Remember, max. 32 stations in grandMA 1 and 200 stations in total in grandMA 2 network.

For each MA VPU application one fixture layer can be created in the desk.

A MA VPU application is working in the "MA-Net" and is identified via the fixture layer name.

All PCs running MA VPU with the same fixture layer name will "grab" what they need out of the data stream and show the same show with the same content. Several ‘Video-fixtures’ configured in the desk can be selected in the MA VPU application via a drop down menu in the status bar or directly via the touch screen:

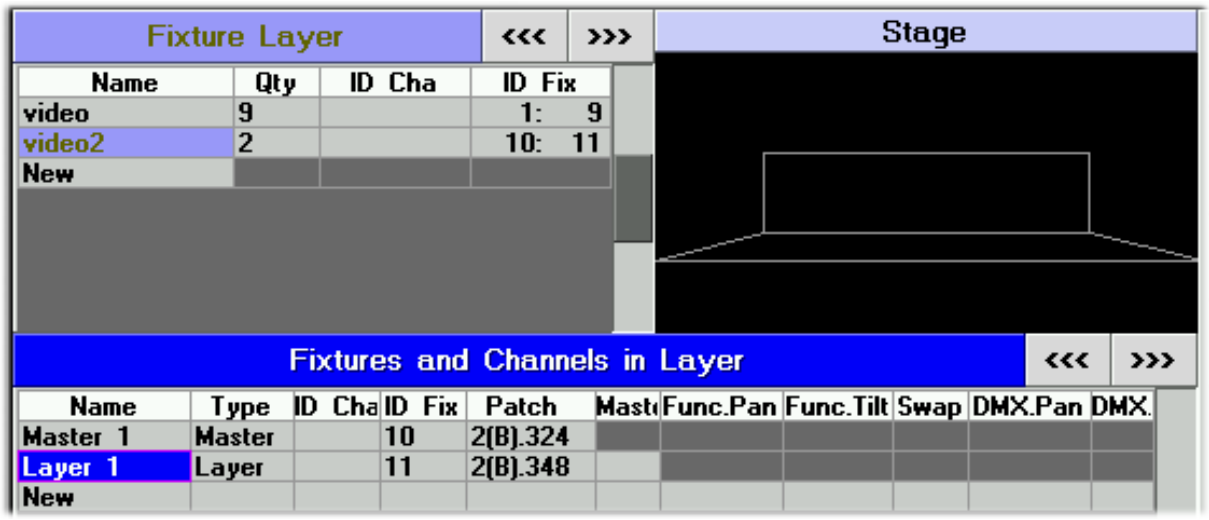
Example with one connected MA VPU application in one Fixture Layer in grandMA 1 mode via Tools – MA Network configuration video:



Or grandMA 2 mode via Setup – Network – Config. Network Video:

A layer in MA VPU is analog to a Fixture in the grandMA desk.

So if you use for example 6 video layers 6 fixtures are patched and shown in the Fixture Layer of the desk.
In this example a second Fixture Layer named ‘video2’ has been added for a second MA VPU application with one Master fixture named ‘Master 1’ and one Video Layer named ‘Layer 1’:



6 Quick Guide

This chapter gives a brief description how to operate with the MA VPU application.

6.1 Quickstart with grandMA1

– Start master session and connect to the desk:

To give you a sense of achievement MA VPU is delivered with a short demo file that can be opened via the menu entry ‘File – Default Show’. This gives a survey of the possibilities of manipulation.

If you carry out this example the video application starts a master session and transfers its show to the connected desk or onPC.

Attention! Consider that the actual desk show will be overwritten if you carry out this example.

For the following steps a grandMA desk or the grandMA onPC should be connected.

Without the connected desk, or onPC editor, you are able to do the setup where the used pictures and videos are stored, but you cannot control the resulting output via the desk.

Start the connected desk or onPC with an empty show.
(Backup; Load Show; New Show)
At: ‚Tools’ ‚MA Network’ make sure, that no session is running.
If not, stop the session with ‘Leave Session’.
Then start MA VPU.
Start the ‘New Show’ via the menu entry ‘File – New Show’ or at the touchscreen ‘Setup – New Show’.

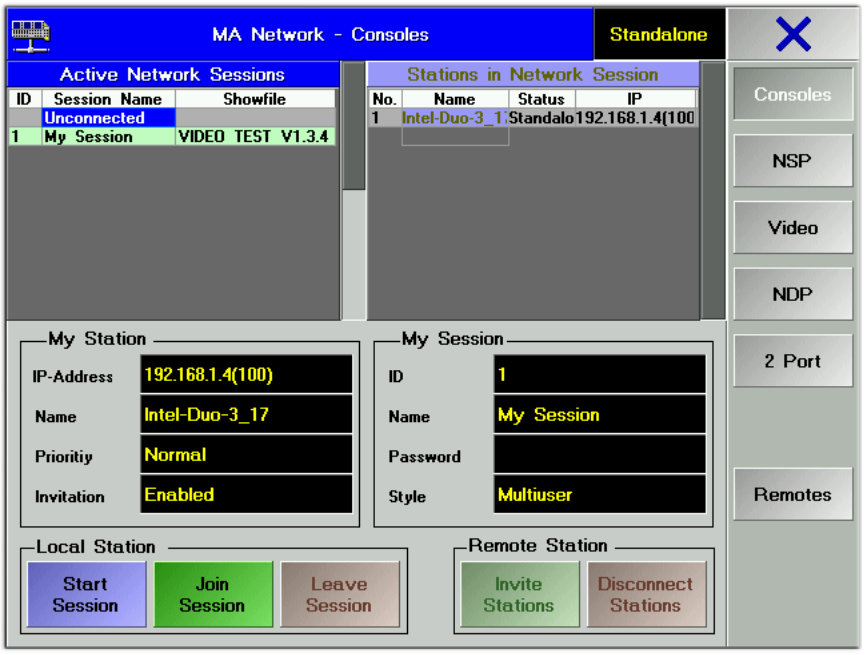
If no MA session is found, this is indicated by a red broken heart in the status bar. Please Note: If you are not in a session or the master there will be no output!

Create a new session by opening the network dialog (click ‘Network’), and then click the ‘Create Session’ button. The Master state will be indicated by the blue heart.

Now you can invite the desk or onPC to the MA session (grandMA 1 only; in grandMA 2 join the session from the desk): Click the ‘Invite Station’ button (Settings - Network) and select the Station (Desk or onPC). Invite the station by clicking the OK button.

Show data of MA VPU will be transferred to the desk.
This is signaled via a progress bar.

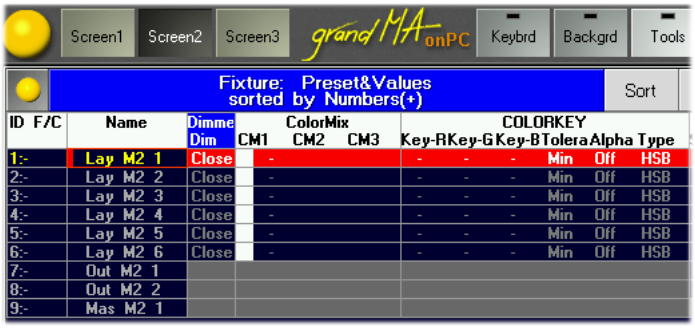
Note:
MA VPU can create a session as a Master. If a desk joins into this session, the desk will become the master and MA VPU will become the slave. All show data on the desk will be overwritten!
From now on the desk becomes the master of the grandMA session and MA VPU joins as slave:



You also can join the session via the desk or onPC.
Therefore select the 'Tools' button on the desk and open the 'MA Network' dialog.
Select the 'Active Network Session' and click on 'Join Session'.
The show will be transferred to the desk and the desk will become the master of the session (if it was created from MA VPU).

Controlling Images and Videos via the grandMA 1 desk:

Now you have access to the images and videos arranged in the demo show of MA VPU.
The surface of the touch screen should look like this:



The column 'Name' shows all configured layers of the show file.
In the columns beside all available effects for this layer are listed.

Now we'll see how to control MA VPU via the desk:

Click on the 'Preview' tab of MA VPU to watch the resulting output preview. If you prefer a Fullscreen view, apply the 'Fullscreen' button in the toolbar (back with the 'Alt + Enter' button).

Select a layer and open the dimmer.
Now you can fade in the actual selected image for the layer.

If you want to change the image or video for the layer, scroll through the image selection with the encoder wheel or select the image or video from dialog after clicking on the image entry.

For example if you select the image 'Color Test stepless.bmp' the preview window shows this image.

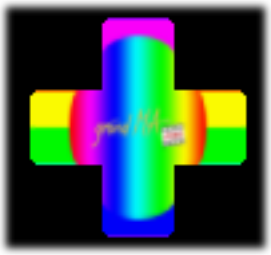
Now you can test the effects and see how the change of a value on the desk affects the resulting output in the MA VPU preview window.

We will see how this Texture looks on a 3D Object:

Select the '3D-Objects' at the desk:

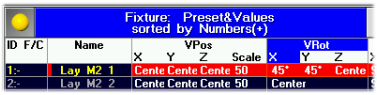
In the next dialog you can select a 3D Object to project onto:

Select the 'Cross'.

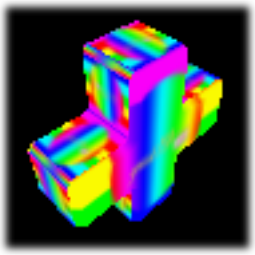


The resulting output in the Preview looks flat, because you are looking perpendicular on the 3D cross.

So let’s rotate the cross:



Therefore enter values e.g. 45° into the VRot field.



The result in the preview shows a rotated cross with the new texture.

Instead of a simple texture you also can map a running video on the 3D Object.

Feel free and change other parameters.

This is the best way to see how MA VPU works.

6.2 Quickstart with grandMA2

At first start the VPU with grandMA 2 network.

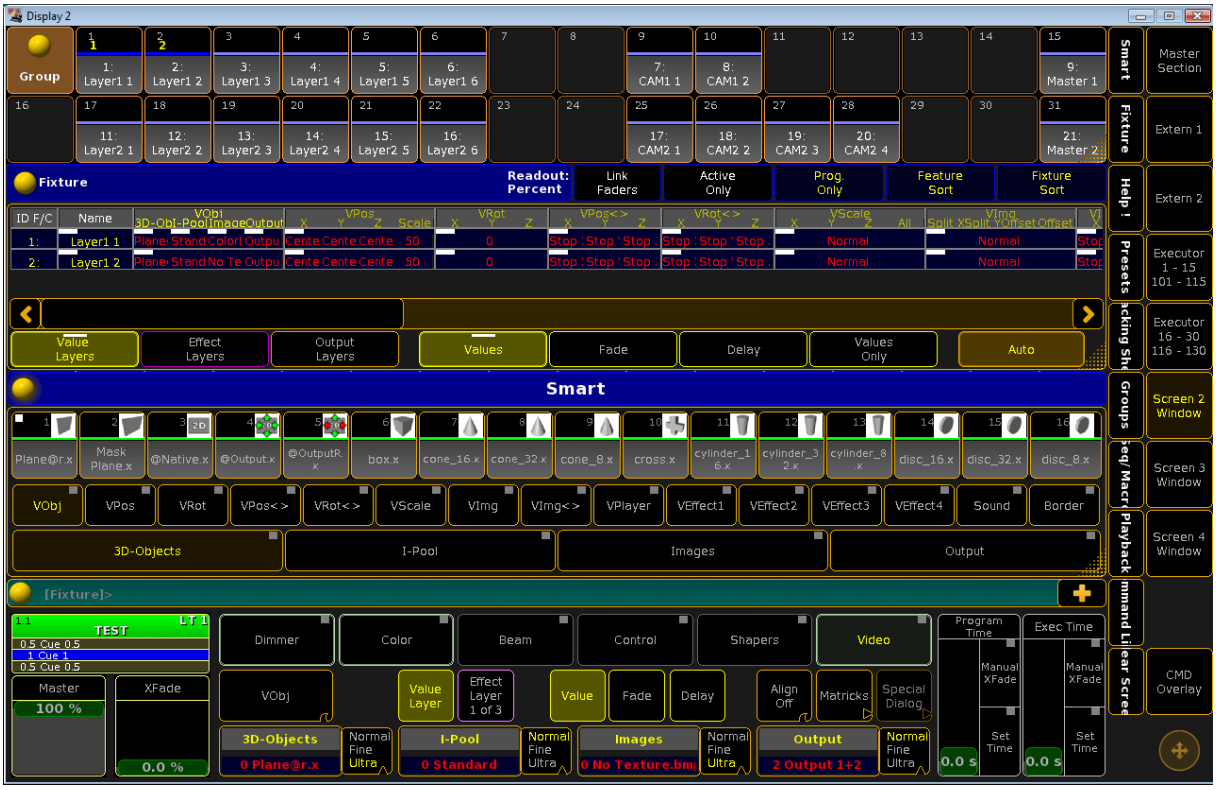
Start the grandMA2 OnPC

Press ‚Backup' and select the tab 'Demoshows' – 'Load Show'

In the upcoming dialog select the 'vpu demo show.show.gz'

The show will be loaded.

On the Display you see an overview of the layers and the fixture sheet:

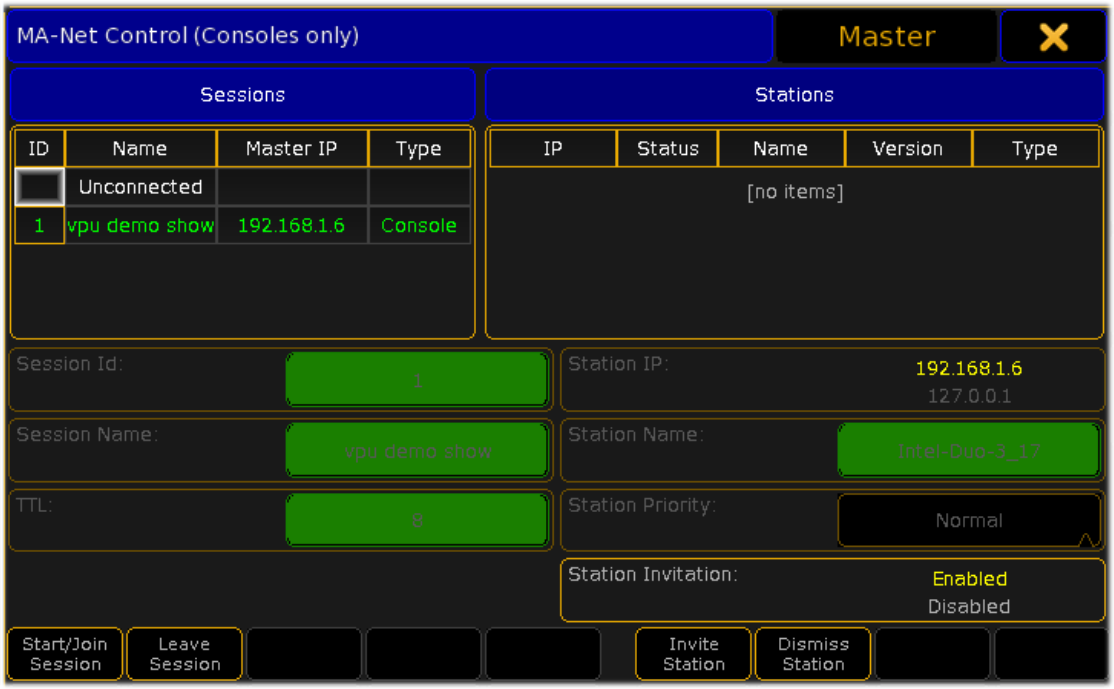


You can configure the layout via the buttons on the right:

Now we will invite the VPU to the session:

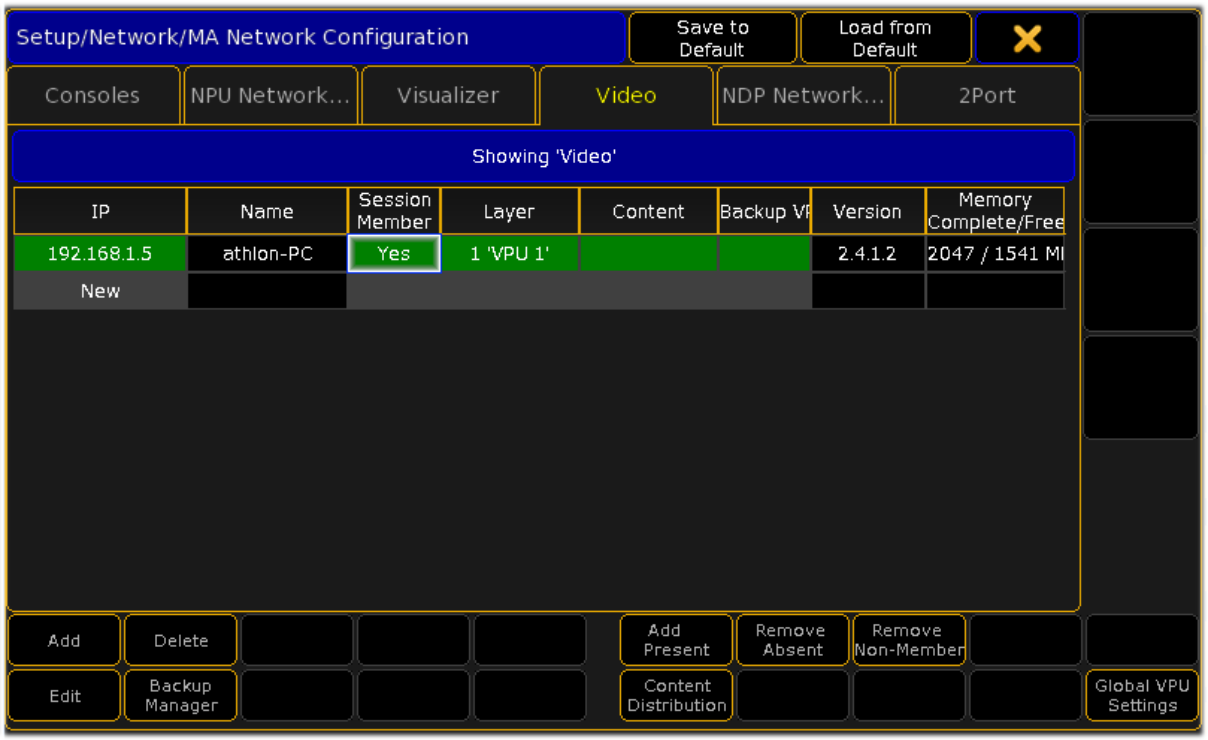
To start a session press ‘Setup’ select the tab ‘Network Master’ and press ‘MA Network Control’

Press the ‘Start/Join Session’ button. The session will start:



Press ‘Setup’ select the tab ‘Network Standalone’ and press ‘MA Network Configuration’

In the upcoming dialog select the ‘Video’ tab:



If the VPU is not already a member of the session, select the ‘Session Member’ entry.
It will change to ‘Yes’ and the VPU will join the session.

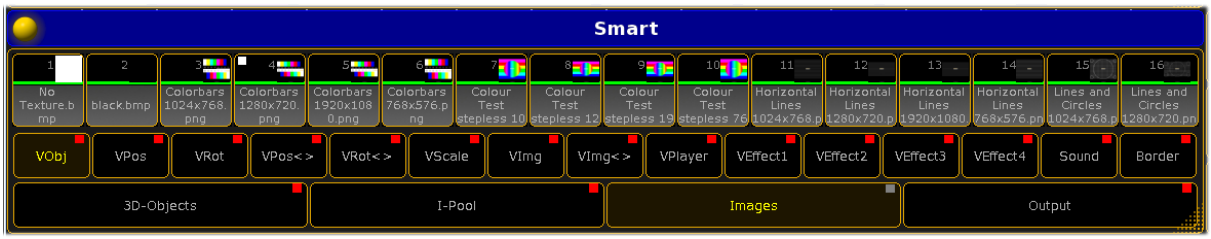
Note:
If the VPU won’t join check the VPU IP address. It is displayed in the VPU status bar e.g.:

In this case the desk IP is *192.168.1*.6 and the VPU IP is *192.168.1*.5
Console and VPU must be in the same IP segment that means the first *three* numbers must be equal.

Now you can select the ‘Layer1 1’ button on the display:

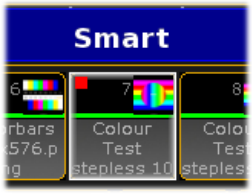
On the Fixture sheet you can see all settings of the Layer1 1:

On the Smart sheet all settings of the VPU Layer are displayed as buttons.
Select the ‘Images’ button and you get an overview of all images of the selected I-Pool.



Click an image button and the appropriate image is displayed on the VPU output screen:

Desk Image button

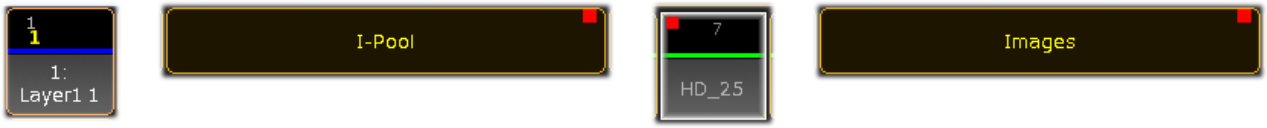


VPU output

To change the VPU output screen select the ‘Master 1’ Layer and the ‘Control’ field:

The ‘Smart View’ offers the controlling possibility to watch the output in ‘Fullscreen’:

Press the ‘Clear’ button, change to ‘Layer1 1’ and select the ‘I-Pool’ ‘HD_25’ and ‘Images’:



Now the ‘Smart View’ offers a choice of video loops in HD quality with 25 frames:

Select a video of your choice and press the ‘VPlayer’ button.
Now you can choose how to play the video e.g. as a loop, select ‘Loop’:

The selected video should be played in an endless loop on the VPU in the fullscreen view.
Feel free to try other modes and effects to learn how the VPU works.

7 Program Surface

After starting the program an empty show will be opened or if connected with a desk or onPC the show will be loaded. The surface should look like this:

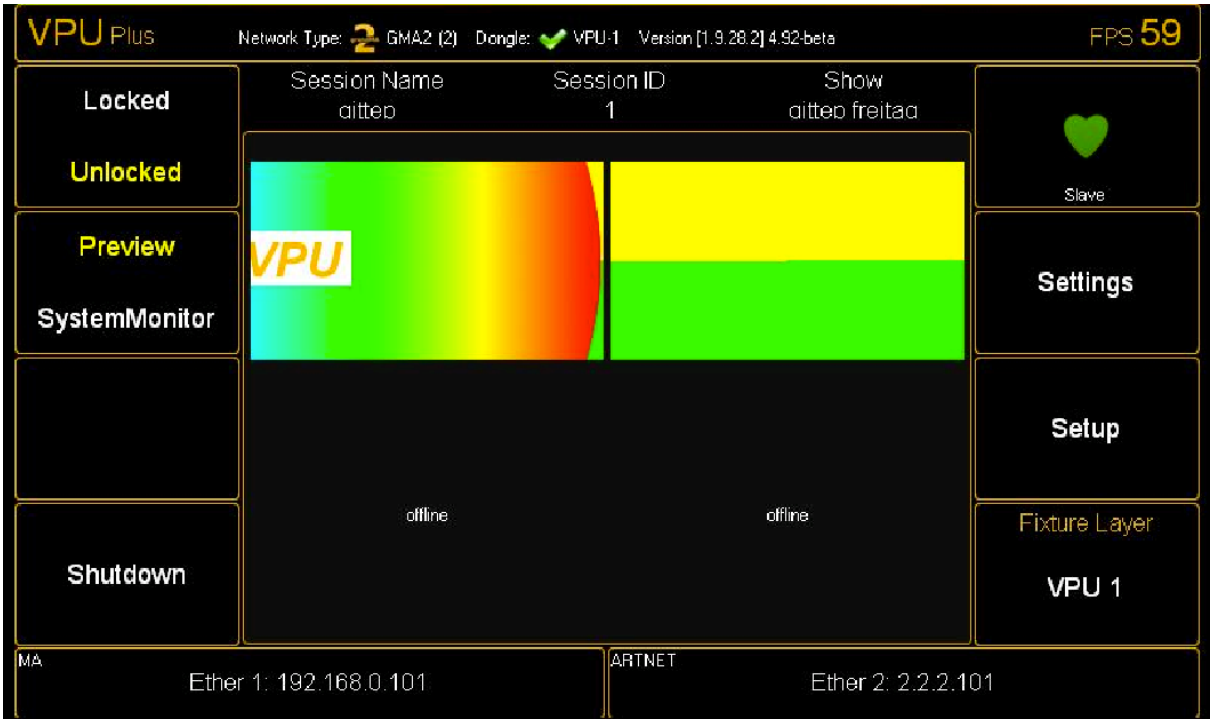
As already known from other applications, the program surface is divided into several parts:

Menu bar	
Toolbar	
Preview, Multi Preview, Content Editor, Pixelmapper (if this mode is selected)	Overview window for images and videos of the channel functions or the LED panels in the Pixelmapper
Status Bar	

7.1 Touch Screen

(Only MA VPU pro and MA VPU plus)

The touch screen offers a direct access to important VPU functions and shows which content is send actually to the outputs:



The headline informs about the network type and VPU software version. Also the session ID and name of the show is shown.

The lower part shows the IP addresses of the MA-Net and Artnet adapters.

Most important VPU functions can be operated directly:
- Lock / Unlock the touchscreen buttons

- Switch between the output preview and system monitor information

- Shutdown or reeboot the VPU

- Indicates the status of the MA-Net see: 3.4 Connection States

- Opens settings dialog (Display, Network, Main, Video In)
as described in 7.2.1 File....Settings

- Opens the Setup dialog (New Show, Load Show, Save Show as, Update Software, Pixelmapper/DVI
, Restart with grandMA 1/2 Network)

- Select the fixture layer

7.2 Menu bar

Like in several other Windows application you can store and recall files, and adjust the settings of the program:

7.2.1 File...

New Show	Creates a new show with 6 Layers, 1 Master fixture and 2 Camera fixtures.
Load Show…	Opens a dialog to load a showfile (.gvs – grandMA 1 or .gz – grandMA 2 file).
Save show as…	Opens a dialog to save the current show at a given filename.
Settings…	Opens the Settings dialog: Within this dialog you can set: - Display settings - Network settings - Main settings e.g. FOH feature - Video In settings

Settings…
Display

Set the display properties:

Output: Up to 4 monitor outputs (VPU pro only) are supported.
- Camera: Each output can display a different camera.
- GUI: Select the output for the GUI (**G**raphical **U**ser **I**nterface)
- EDID: State of EDID Manager see:2.7 EDID Manager
- Monitor: Name of the physical interface card
- Refresh rate in Hz
- Resolution for output

Global:
- **Monitor Identification**: Shows a number 1…4 on the output to identify it.
- **Fullscreen GUI**: Show the Graphical User Interface in fullscreen
- **Activate all Monitors**: Activates all outputs of the graphic card

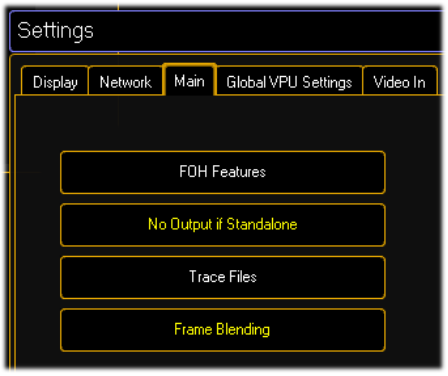
Settings… Network

Within this dialog you can set the properties for the network.

The dialog shows the actual state of all machines in the MA net:
Red text: Allow Invite Disabled.
Green background: selected station.
Red background: version is not compatible.
The different states in the network are described in detail in chapter 3.4 Connection.

Settings…

Main

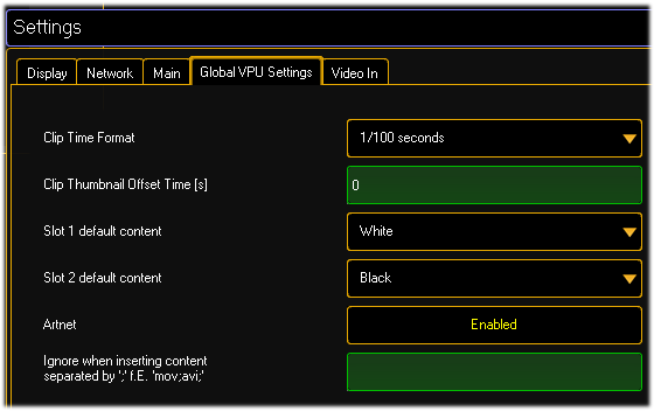


Within this dialog you can select the

FOH features:
If this button is checked an additional buttons appears at the toolbar.
The button ‘Blind’ preserves the blind programming preview.
No Output if Standalone:
If no desk is connected the output is suppressed.
Trace Files
To get log files (in case of crashes) this must be switched on. The trace files can be found in the trace file folder on the desktop.
Frame Blending
Frame interpolation allows smoother motion when you slow down or speed up a layer.

Settings…

Global VPU Settings



Within this dialog you can select the

Clip Time Format: Clip timing calculation, e.g. clip with 30 fps and clip time Format 30 Fps, Encoder Speed finest/ultra: you can step framewise through the clip. If you prefer to step Frame Index in seconds you select „seconds“. The setting will be spread via network so all VPUs have the same clip time format.

Clip Thumbnail Offset Time: Thumbnails show the first frame of a clip, if this is empty you can add an offset to get a meaningful image.

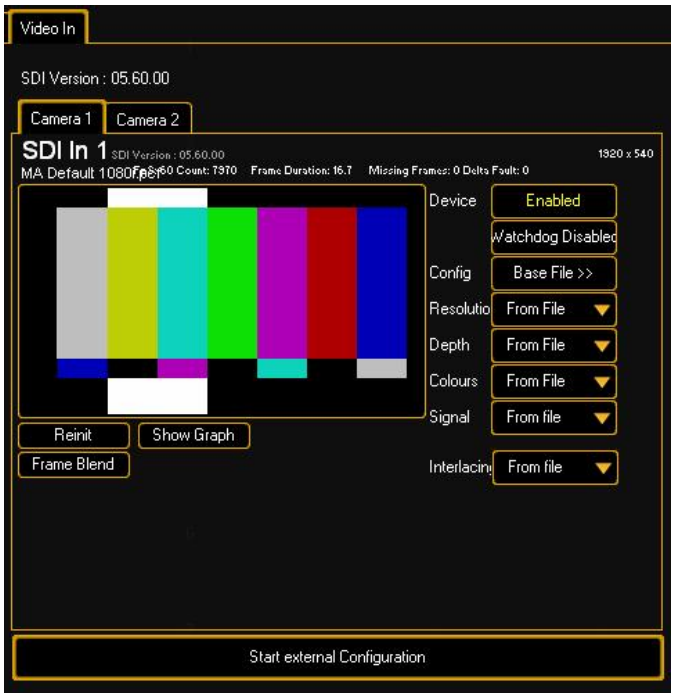
Slot 1/2 default content:
Set the default image of the first slot to black or white.

Artnet:
Enable or disablke Artnet.

Ignore when inserting content…:
If a whole folder of content is importet you can ignore files by specifying the extension e.g. if the folder contains also ‘.avi’ files and you only want to import the ‘.mov’ files the ‘.avi’ entry suppresses importing of all ‘.avi’ files.

Note: the following dialogs are only available in the Widowed Mode

Video in…



SDI In Configuration
The first line shows the actual status of the SDI input signal.
Device: Enable/disable SDI input.
Watchdog: If SDI signal is missing an automatical initialization is done every 30 ms.
Config:There are 3 preconfigured files for SDI In MA provides:
MA default 1080i (Full HD 1920x1080)
MA default 720p (HD 1280x720)
MA default 576i (PAL 720x576)
i (interlaced)
p (progressive)
Resolution: Select SDI input resolution
Depth: Signal depths in bits. Regular SDI uses 8 or 10 bit.
Colours: Signal colour space. Regular SDI uses 4:2:2 YUV.
Signal: Interlaced or progressive

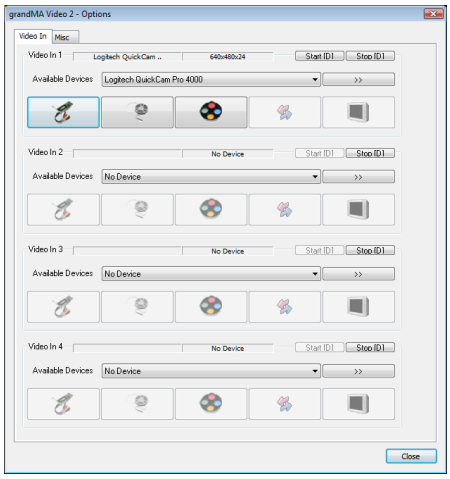
Interlacing: see list below:

Reinit: Reinitializes the SDI input
Show Graph: Shows a performance graph
Frame Blend: Use Frame Blending to enhance the quality of time-altered motion.

Interlacing Formats:
Here you can define how images are handled within the application. Since grandMA VPU does only output progressive scanning via DVI these settings may effect your image quality.

- Interleave 1 and 2
  field one is interleaved into field two
- Interleave 2 and 1
  field two is interleaved into field 1
- Field 1 then 2
  field one is displayed first (and stretched to full ratio) then field two
- Field 2 then 1
  field two is displayed first (and stretched to full ratio) then field one
- Field 1 only
  field one is displayed (and stretched to full ratio), field two is not displayed
- Field 2 only
  field two is displayed (and stretched to full ratio), field one is not displayed
- Field next

Video in…
Start external
Configuration



If you are not using SDI but want to use other external video feed like a webcam you can run 2 external devices:
You cannot access this button via the touch screen, only via the GUI.

External Video Configuration:

This interface allows the input of a live video stream. It is realized via the Microsoft Direct Show mechanism.

Video In 1…4:

In this dialog up to 4 different 'Video In' devices can be assigned.
Every Video Capture Device supported by Windows can be used as input source for MA VPU.

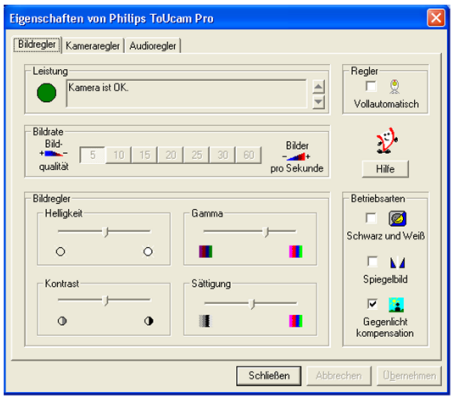
Available Devices:

All recognized Video Capture Devices are listed in this selection bar. By selecting one device this will be assigned to the 'Video In' source and is available for MA VPU.

Start / Stop [D]

Additional options to restart drivers in case of synchronization faults.

Video in…
Device

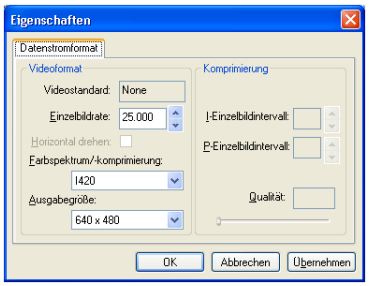


Device…:

If a Capture Device with a driver is installed, its property dialog will be opened after the selection of this button.
In this dialog the device specific properties of the manufacturer can be managed. The following example shows the property dialog of a webcam:

If no device property is available, nothing happens.

Video in… Device Settings



Stream…:
If a Capture Device with a driver is installed, its streaming dialog will be opened after the selection of this button.
In this dialog the device specific streaming properties of the manufacturer can be managed. The following example shows the property dialog of a webcam:
If no device property is available, nothing happens.

Restart with grandMA 1/2 Network

Switch between the grandMA 1 and grandMA 2 mode. The application restarts in the next mode.

Exit

Leave the application.

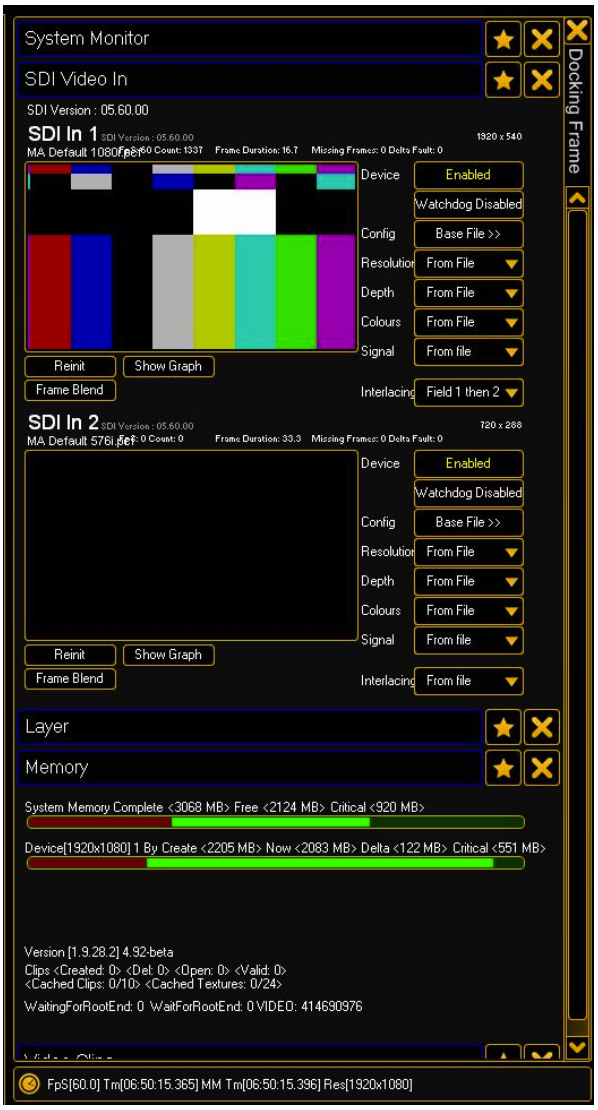
7.2.2 View...

Dialog Docking Frame	Opens a dialog to arrange your views, see below.
Timing Window	Opens window with timing information to check the performance.
Info Window	Opens an Info window for internal purposes.
Layer Window	Opens a window with information about the layers as type, Show on Head, Scale etc..
System Monitor	Opens the system monitor that shows communication data between the desk and VPU.
Video Clips Window	Opens a window that offers information about the used video clips. This can be helpful for troubleshooting.
Start in Fullscreen	The application always starts in the ‘Fullscreen Mode’
Show FpS in Fullscreen	Show the framerate in FpS (**F**rames **p**er **S**econd) in the fullscreen output.

The following entries are only visible if the option ‘Menu – File – Settings – Main – Extended Menus’ is selected:

Error Window	Opens a window with internal error messages.
Memory Window	Opens an overview window about the usage rate of the memory.
Statistics Window	Opens an Info window for internal purposes.

Dialog Docking Frame:



The Docking Frame contains all opened Views. Views can be minimized or opened by pressing the star or removed by clicking the x. So now it is possible to keep dialogs open for monitoring reasons and close all dialogs by one click and open exactly the same views by only one click. You can scroll in this frame and the preview or multi preview will be downscaled when Docking Frame is opened.

SDI Dialog

There are 3 preconfigured files for SDI In MA provides:
MA default 1080i
MA default 720p
MA default 576i

In the „Config“ drop down you can select those files. Afterwards you need do set the drop down „Interlacing“ to Field 1 then 2. If you need any other resolutions just select any other resolution in the drop down „Resolution“.

Memory Window

This window gives you an overview of the system memory. The first bar is the complete System Memory, the second bar the memory of the graphics device 1 and the third bar shows the memory of graphics device 2. So on this example we have different resolutions on both outputs - which means 2 devices for the system and this may indicate that working with different resolutions cuts the system down in performace - as two devices are in use. So keep in mind to avoid using different resolutions whenever possible. You can do so but the headroom is reached much faster.

Timing Window

Shows: FpS, Runtime, Resolution

7.2.3 Mode...

DVI	Switch the output signal to DVI (**D**igital **V**isual **I**nterface) output.
Pixelmapper	Enable the Pixelmapper see also chapter: 11 Pixelmapper. Pixelmapper Editor will be enabled and video output will be transformed into DMX values. Finally output via Ethernet adaptor (Artnet) to RGB devices/fixtures.

7.2.4 Help...

Release Notes…	Opens the release notes document.
Info…	Shows the about box with the current version number. In the lower part of the box you can find the license information and the Dongle Serial Number.

7.3 Toolbar

The toolbar contains several buttons that are related to the general operations of the program.

Network… Shows the actual network state or opens the MA Network dialog as described in 7.2.1 File...

Toggle GUI : Switches the GUI (Graphical User Interface) off. You can also use the 'Shift + Enter' key on the keyboard to switch the GUI off.
Leave the full screen mode with the 'Shift + Enter' button
Note: MA VPU always runs in Fullscreen View. Only if the VPU is installed on a PC with a protection dongle (former grandMA Video application) the switching between Windowed and Fullscreen is relevant.Therefore you can use the 'Alt + Enter' key.

Blind: (Only enabled if the 'FOH Features' in the Options Dialog is enabled)
You can take or reject the 'Blind Preview' from the desk by selecting the appropriate check buttons. If the 'Blind Preview is active, the button gets blue.

Channels: (Only enabled if 'Multi Preview' tab is selected)
Toggle the Channel controls in the 'Multi Preview'.

7.4 Status Bar

The status bar offers an overview about the system status:

Type of network:
grandMA 1 or grandMA 2

Connection state in network:
Not connected, Master, Slave or Sniffer as described in: 3.4 Connection States.

Name of the showfile

Shows the status of the dongle

Used IP address for MA Net

User of grandMA show rights: ‚Restricted' or ‚Administrator'

Shows the used fixture layer. You can switch the fixture layer via this drop down menu.

Assign the VPU Camera (e.g. Camera 1) to an Output. This function is identical to the former "Softedge ID".

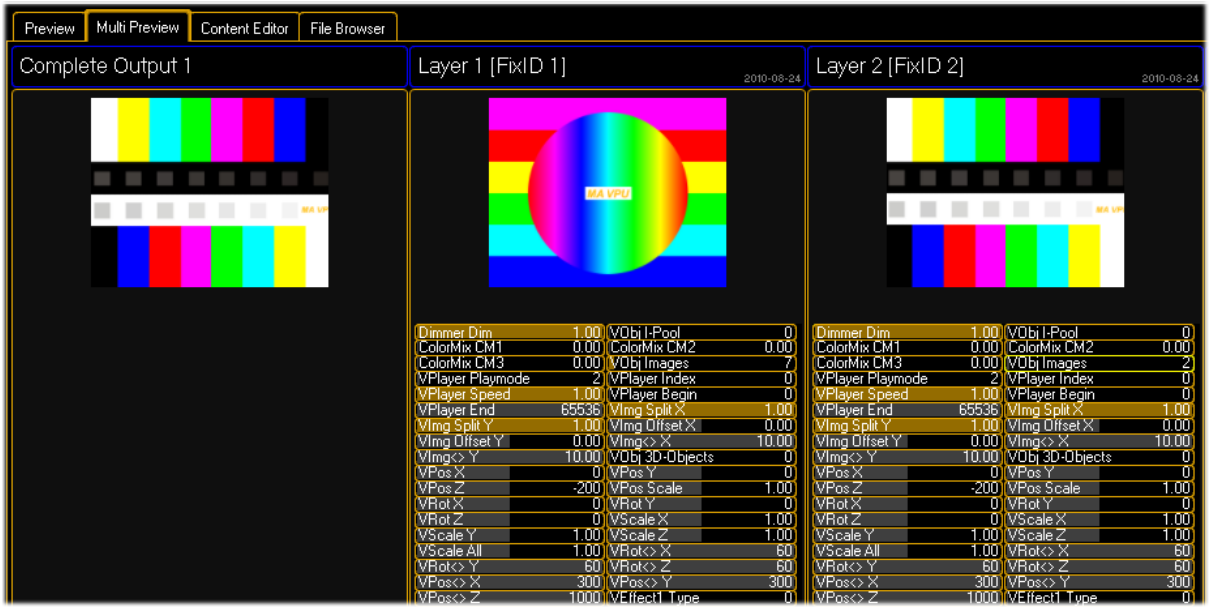
7.5 Preview

This view offers a preview of the resulting output video.

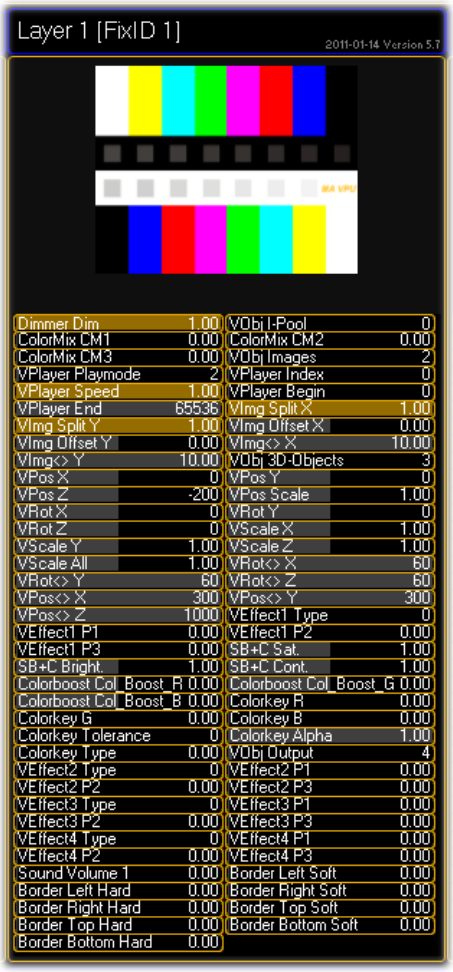
If you enter the tab, MA VPU receives the commands from the desk and shows the resulting output but in opposite to the Fullscreen view the menus, the toolbar and the status bar are also active.

7.6 Multi Preview

This View allows an overview of all layers, their effects and the resulting output:



The example above shows 2 layers with the resulting output picture for a single head output. If 'Dual Head' is enabled via the menu entry 'File - Settings – Display' the output for the second display is presented too.



The content of each layer is shown in a small window.

The controls below allow watching the effect values for each channel in the layer. The horizontal bar in each control indicates the setting from 0…100 %.

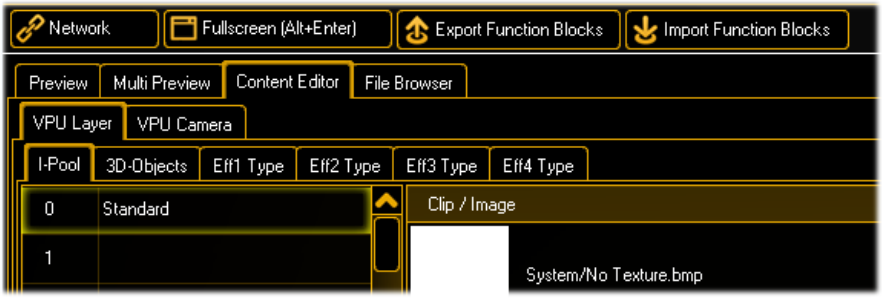
Changing values are highlighted. Please note that these are no programmer values but all changes from the default values are indicated this way.

You can toggle the controls with the ‘Channels’ button in the toolbar:

If the 3D-Object is a native object like ‘@Native.x’ Scaling, Rotation and Position Z is not possible. This is indicated by a red hint ‘native’ in the title bar:

7.7 Content Editor

By selecting the ‘Content Editor’ tab this view is activated.

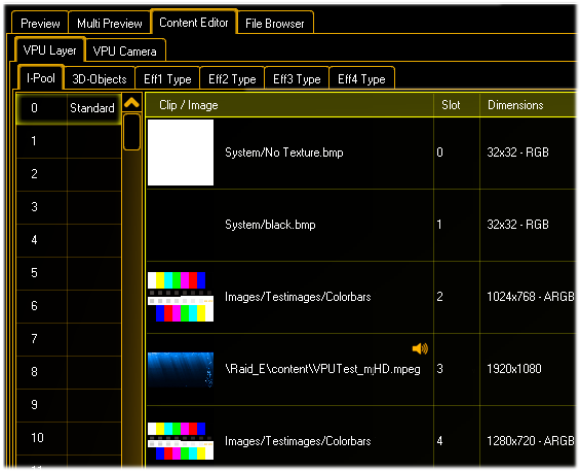


In this view you can edit the content for VPU Layer and VPU Camera e.g. videos images and 3D objects:
VPU Layer: ‘I-Pool’; ‘3D-Objects’ and ‘Eff Type’
VPU Camera: ‘Images’, ‘Eff Type’ and ‘3D-Objects’

7.7.1 Content: Image Pool (I-Pool)

MA VPU comes with a sample library containing images, gobos and video clips. This content is preinstalled on the VPUs and can be ordered from MA Lighting.

Similar to the magazine of a slide projector such a folder behaves like a slide magazine. Up to 255 folders can be accessed directly from the desk. The different images and videos of a folder correspond to the ‘Channel Sets’ of the desk and can be accessed from there.
To insert images and videos click with the right mouse button somewhere in the ‚I-Pool Folder’ or ‚Channel Functions’ field and navigate in the upcoming dialog to the folder where the images and videos are located. It is not recommended to use an external drivefor the content, we recommend to copy the files to the content drive D:.
After the selection of the folder and confirming with ‘OK’ it will take a while until the images are shown because MA VPU has to build a so-called thumbnail (little image) for all items. Therefore each file has to be opened and searched for a usable picture.



Items can be edited, changed or deleted via the context menu of the right mouse button. Data of the items like size, framerate and length are shown in a grid. If an item is selected its preview is shown in the preview window at the lower left side of the screen.

Multiple items can be selected if you hold down the ‘Ctrl’ key while selecting items or use the mouse as a lasso. Hotkeys, ‘Ctrl’ + x,c,v (Cut, Copy, Paste) and ‘delete’ are allowed.

Video clips do have a video thumbnail showing the first frame of this clip. If the clip contains sound this is indicated by a yellow speaker icon.
If the clip is selected you can see a preview in the left corner below.

If a clip does not fulllfill the content specifications this will be indicated by a red blinking text and an exclamation mark and cannot be previewed.

Sound only files like mp3 or wav are displayed with a speaker icon.

To assign a new folder to a ‚Channel Function' click with the left mouse button into a line.

A context dialog appears.
After selecting the entry a browser window appears where you can navigate to the folder containing the videos.

If the switch 'Global VPU Settings' 'Slot 1or 2 default content' is selected a white or black image is inserted always at the first position.

After the selection of the folder its name is taken as a name for the ‚Channel Function' as shown in this example ‚Test Images'. You can change the name via the context menu with the right mouse button

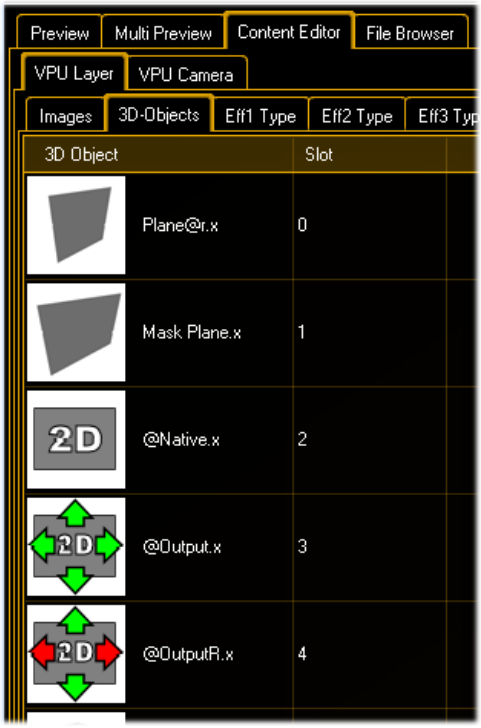
Export and Import Function Blocks

With this function it is easy to change Fixture Types of old shows without losing content information or manually inserting it again.

1. Export Function Blocks
2. Exchange Fixture Type
3. Import Function Block again
4. The show can go on!

7.7.2 Content: 3D Objects

The tab ‘3D-Objects’ shows the projection objects of the layers.
In the simpliest case a layer contains a 2D plane object. This is a canvas where images or videos are shown like on a TV screen. But this screen mustn’t be flat. You can use 3D boxes, cones or other 3 dimensional objects to render your images or videos.
The fileformat is DirectX with the file extension ‘.x’ see chapter 12 Creation of customized 3D Objects.



Items can be edited, changed or deleted via the context menu of the right mouse button.

Data of the items like name and size are shown in a grid.

To assign a new item insert a ‚Channel Set’ via click with the right mouse button.

3D object definitions:
If you use objects with the extension „**@r**“ like „**Plane@r.x**“ the aspect ratio of the object fits automatically to the aspect ratio of the texture (Ratio of width / height e.g. 16/9).
So we recommend using this object (Plane@r.x) for the easy projection of videos.

Objects with the extension „**@2D.x**“ are displayed as 2D Plane exact in that dimensions that are given by the used texture. This happens exactly as determined by the texture. Via the position parameter these objects can be moved. Rotation and scaling are blocked because the pixel precise displaying won’t work in that case. See example object PixelExact@2D.x.

@**Native.x**: pixelexact keeps image resolution. Scaling, Rotation and Position Z not possible as this is a 2-dimensional object with defined size (defined by image resolution!).

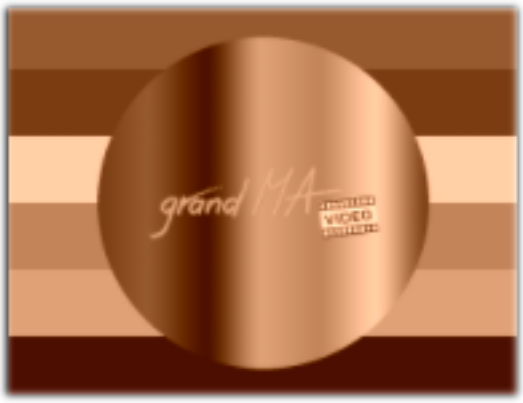
@**Output.x**: scales to full output resolution and ignores ratio. Scaling, Rotation and Position Z not possible as this is a 2-dimensional object with defined size (defined by output resolution!).

@**OutputR.x**: scales to full output resolution and keeps image ratio (Letterbox). Scaling, Rotation and Position Z not possible as this is a 2-dimesional object with defined size (defined by output resolution!).

7.7.3 Content: Eff1 Type…Eff4 Type

The tabs ‘Effect Type 1…4’ show the possible effect types for the layers (Video and Master):

The effect engine is based on the Direct3D standard. Effects are defined within .fx files.
An effect file is a text file with an .fx extension. It defines how something is to be rendered. It includes state information along with vertex and shader declarations. The shader code is written in HLSL (High Level Shading Language).The following example shows the assignment of a sepia effect the test image:



MA VPU comes with a default setup of effect files.
New effect files can be added to the ‚Channel Set’ via the context menu in the ‘Effect Type’ view with the right mouse button.
Examples:
Despite Ocean and Water Effect others only use 1 parameter (1 Encoder Wheel)

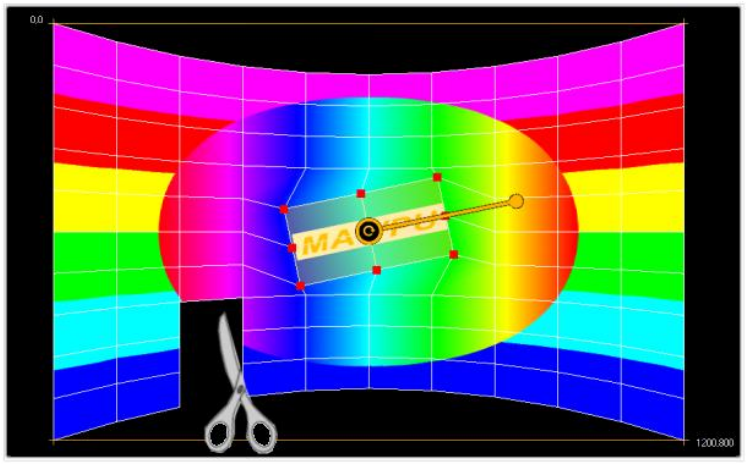
Water	Par1	Circulation
	Par2	Intensity
	Par3	Speed
Ocean	Par1	Amplitude
	Par2	Wavecount x
	Par3	Wavecount y

7.8 File Browser

With the File Bowser you can import content from external hard drives or USB into the VPU or move content to drive D: or wherever by a simply drag & drop. You can delete and rename files or folders and create new folders.
Note: Known issue that you cannot drag and drop on Touch Screen without using mouse.

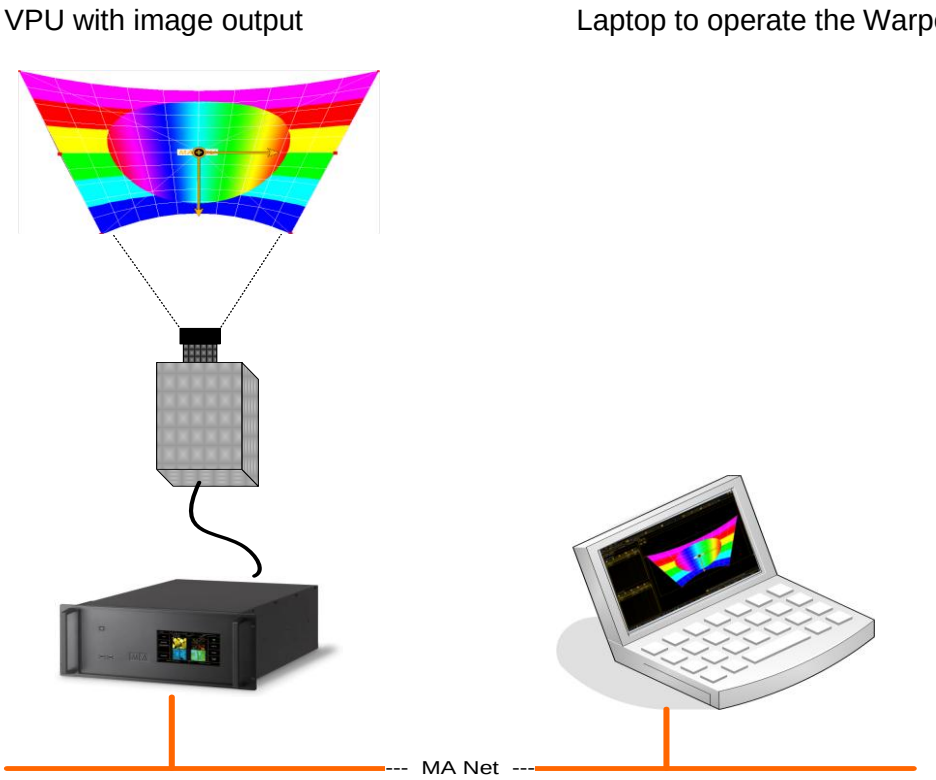
7.9 Warper

The Warper enables you to warp or straighten out the image output on a bended area, stretch, shrink and rotate selected parts of the image and cut out parts of the projection:



7.9.1 Warper Fullscreen View

You can toggle the GUI (via Ctrl + Enter) and watch the manipulated output in real-time while dragging the image into the right position of the projection screen.
Editing the warper objects can be done on the VPU machine simultaneously in the Warper Window and the Warper Fullscreen View. Or the VPU is remote controlled by another VPU PC that is connected via MA-Net. In both cases the warped output can be checked in real time:



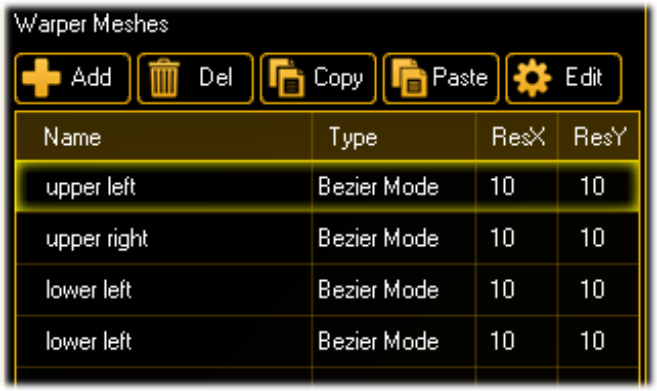
7.9.2 Basic Operation

The Warper functions can be configured via the tab ‘Warper’:

Note:
The Warper only works in grandMA 2 mode!

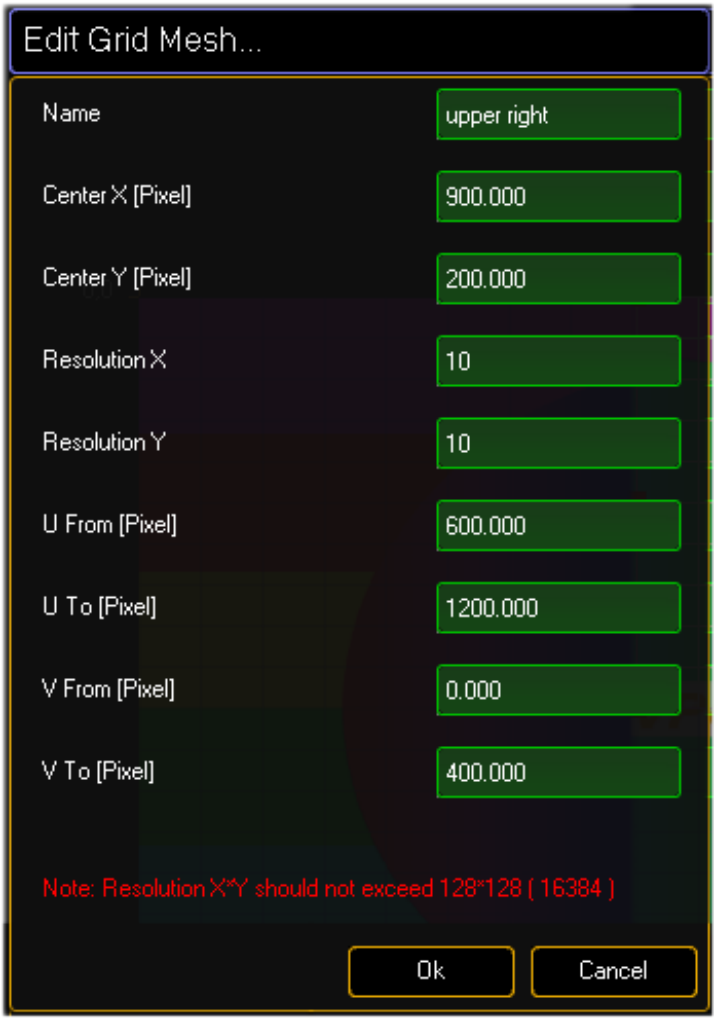
In the ‘Warper Settings’ you can define a Warper object. It is handled by the VPU like the other 3D Objects but it only has 2 dimensions X and Y.
This object should have the dimensions of your output resolution e.g. 1200 x 800 pixels.

Warper 3D Objects can contain several meshes. These meshes divide the projection area into several parts that are defined in the window ‘Warper Meshes’.
E.g. if your projection area is only one big bended plane you only need one mesh.
If the area is splitted into different objects it favorable to use different meshes for these objects e.g. if the projection plane is covered with a box you can define a separate mesh for this box, put this box in font position and edit the characteristics.



Meshes even can overlap. To define the order use the context menu:

If a Warper 3D Object is created a dialog comes up to describes the mesh:



Meshes can be edited always via a doubleclick into the graphic view on the mesh or the mesh list table.

All coordinates refer to the origin 0,0 in the upper left corner.

Name:
Enter a name for the mesh

Position X/Y (Center X/Y):
If a mesh is created with ‘Add’ it is placed to the position (0,0). If the mesh is edited later the entry describes the center of the mesh in X/Y coordinates of the 3D Object in pixel.

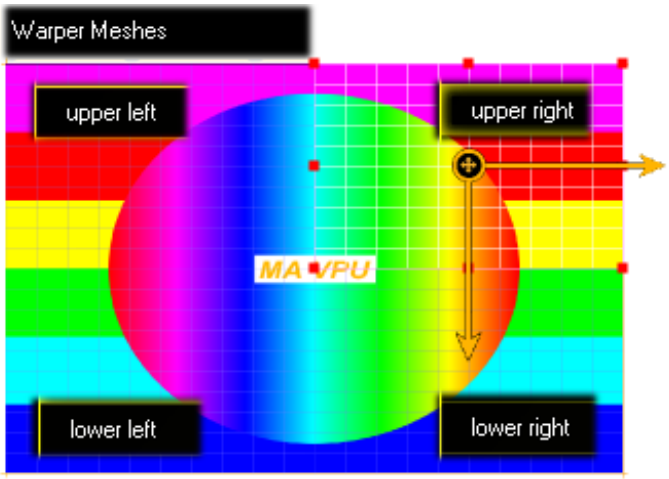
Resolution X/Y:
Describes the grid resolution of the mesh.
The grid divides the mesh into faces that can be manipulated. The resolution is limited to 128x128

U From, To:
V From, To:
Describes how the original image is mapped on the map.

If the U and V values are higher than the resolution of the image, the image is tiled like the VImg Split effect in the layers.

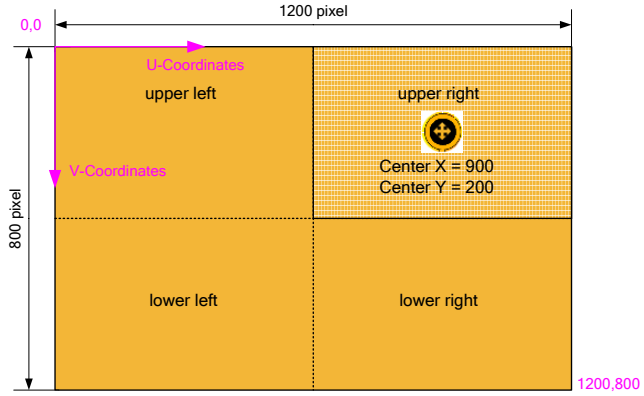
Example

The projection plane is divided into 4 even planes:



This Warper 3D Object is tiled into 4 meshes:
- upper left
- upper right
- lower left
- lower right

Placement of the 4 meshes:



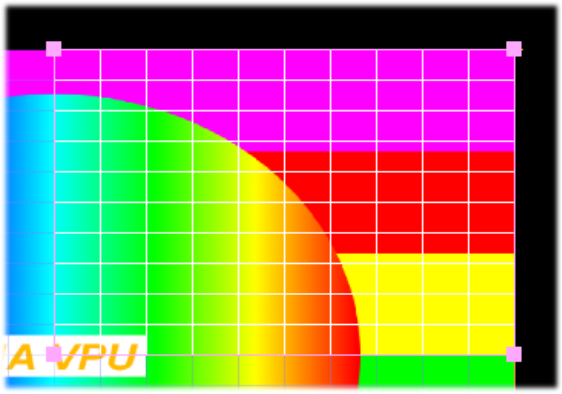
The output image can be placed on the meshes. The coordinates of the output image are described via the U/V coordinates.
The origin (0,0) of the U/V coordinates is in the upper left corner of the image.

7.9.3 Warping

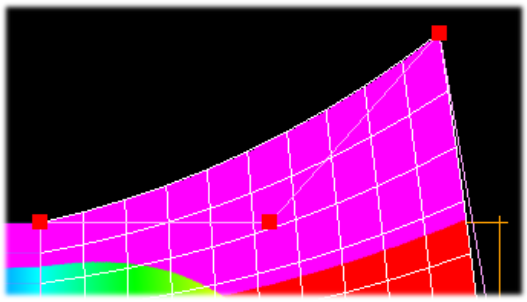
If the Meshes are defined the image can be warped.

The outer frame of the mesh can be edited in the ‘Bezier Mode’.
The inner points or faces can be edited in the ‘Grid Mode’.
Switching between the modes can be done via the context menu with a right mouse click.

Bezier Mode – the outer frame can be edited

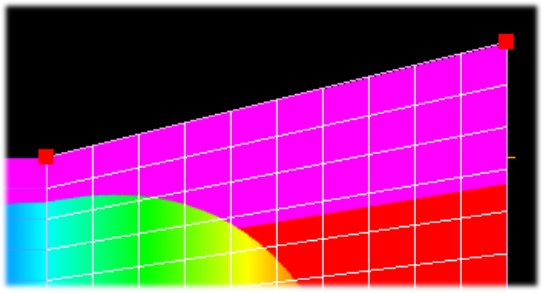


The mesh it is tiled into a grid with a resolution of X/Y points.
The resolution can be increased via the context menu with the right mouse button or edited in the list directly.



Manipulate the outer frame of the mesh by dragging the red marked points.

This example shows a
Bezier function



This example shows a
Linear function

You can switch between the functions via the right mouse click context menu:

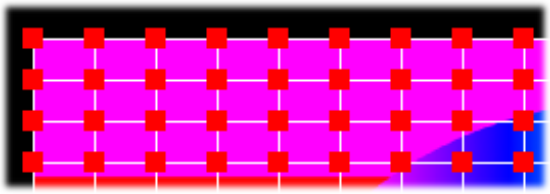
Grid Mode – inner points and faces can be edited

The Grid Mode offers a more detailed adjustment of the output frame.
The grid is a uniform distribution of the mesh into rectangles.

4 points in the grid describe a face.
The resolution of the grid is limited to 128x128.

To change into the Grid Mode do a right mouse click on the preview:

All points in the preview are selected:

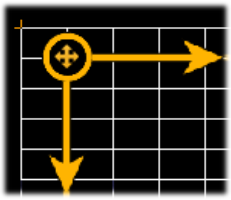


The toolbar shows how the points can be selected:

Switch to the Fullscreen View [Media PC] (Alt + Enter), toggle GUI [VPU] (Shift + Enter)

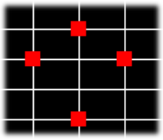
Toggle the Warper GUI (Ctrl + Enter)
Useful to manipulate the output in real time.
It is like the Fullscreen View but the grid and selected points are visible and can be manipulated in real-time.

Switches the control on or off. The manipulation of the selected points can be done via this control.

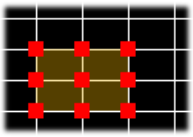


Only active in Grid Mode

Select single points in the grid. Multiselection of points can be done while holding the Ctrl button down or dragging the mouse over the points.



Several connected points form a face (area).

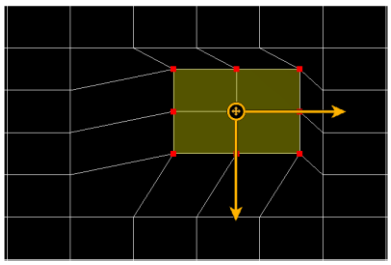


Select all points in a row.

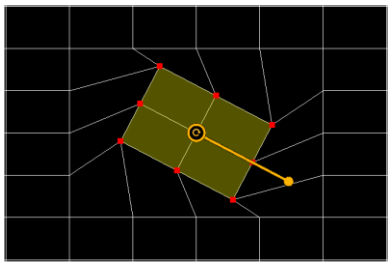
Select all points in a column.

If the points are selected they can be manipulated via the control symbol. Therefore the control must be switched on and the mesh has to be switched into the Grid Mode.
To delete faces use the context menu ‘Delete selected Faces’.

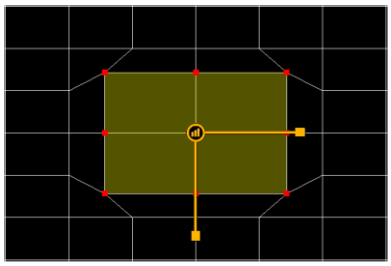
Move the selection:



Rotate the selection:



Scale the selection:



Note: To increase or decrease the mouse resolution hold the ‘Shift’ or the ‘Ctrl’ button

Undo or redo the last action.

This warning appears if unknown 3D Warper Objects are found, e.g. 3D Warper Objects have been created in another show. To use them the channel functions have to be updated first.

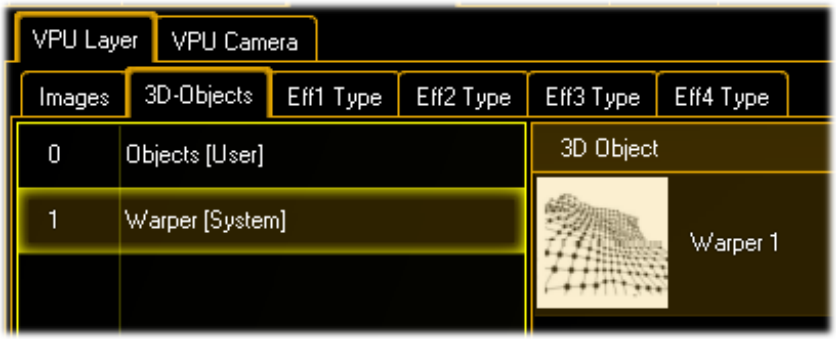
If all manipulations are done you can switch to the Bezier Mode:

This converts the object into a 3D Object.

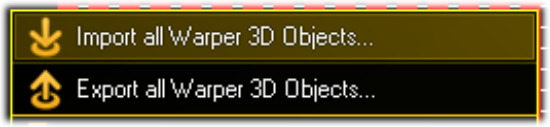
Note:
Switching back from Grid- to Bezier Mode forces a recreation of the 3D vertex data (a new 3D Object is build). The manually changes of the points are lost because they are converted into vertex data! This is always announced via a warning dialog.

7.9.4 Use of Warper 3D Objects

The 3D Warper Object can be used in the VPU- **and** the Camera Layer as well.

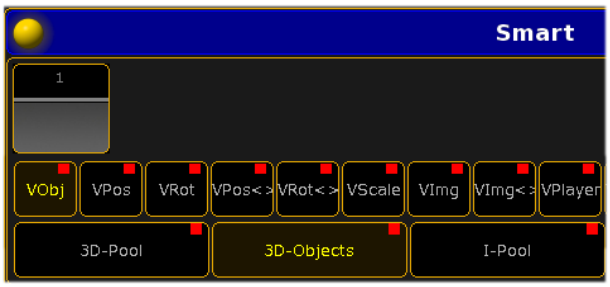


The resulting Warper 3D Object is available in the 3D-Objects folder.
It is stored in the channel set of the VPU fixture type.
Note:
It is recommended to change your existing fixture type to work with the Warper 3D Objects.



Warper 3D Objects can be imported and exported via the right mouse button context menu.

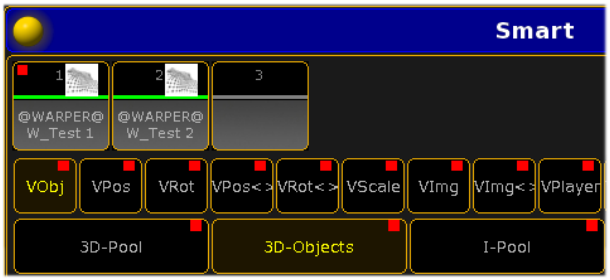
Reuse of Warper 3D Objects
If Warper 3D Objects have been created and would be used in another show the channel functions have to be updated.



The desk shows the Warper in the 3D-Pool but no Warper 3D-Objects are visible…

This is indicated by a blinking button in the VPU toolbar:

Press the button on the VPU toolbar to update the Channel Functions.



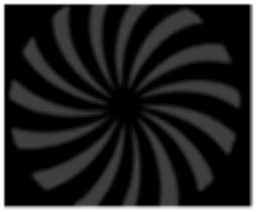
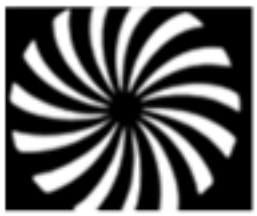
After pressing the button the Warper 3D-Objects are shown in the Smart View of the desk and can be used.

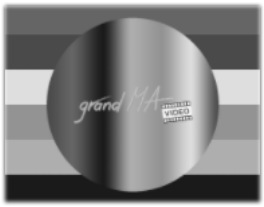
8 Features Attributes and Functions

To explain the layer effect engine it is illustrative to imagine MA VPU as a model of a several movable cameras where every camera looks at a layer object like a 2D plane or a 3D cube.

In these examples an image may be a texture (picture), or a video.

VPU Layer:

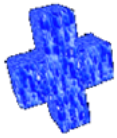
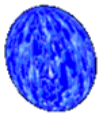
Layer Features and Attributes	Example with values in %	
Dimmer **Dimmer**	Dimmer **50 %**	Dimmer **100 %**
Dimmer function. To facilitate fading between different layers the dimmer controls the transparency of an object. If the dimmer is 0 the object is transparent and the projection is invisible. If the dimmer is “full” the object is opaque and you can only see the front layer (front Z-position)		

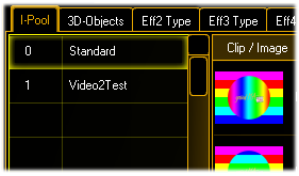
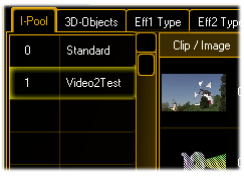
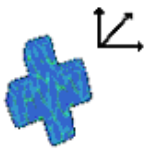
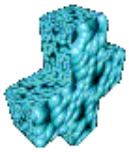
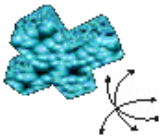
Layer Features and Attributes	Example with values in %	
	Color	
ColorMix (CM1; CM2; CM3)	Color (0,0,**0**)	Color(0,0,**100**)
Tint the output with the CMY(Cyan; Magenta; Yellow) color mixer		
HSBC (**H**ue **S**aturation **B**rightness + **C**ontrast)	SBC (0,50,50,50)	SBC(0,0,50,50)
Set, Hue (position in the color space), Saturation, Brightness and Contrast of a layer		
Colorkey (R; G; B; Tolerance; Alpha; Type)		Layer 2 Key R,G,B (100,0,0) Tol R,G,B (10,0,0)
Set the transparency for the foreground object. For each RGB channel the value and tolerance can be set separately. First select the color then set the tolerance. The switch ‘Alpha’ decides if the pixel gets complete transparent or opaque in dependency to the color key. The switch ‘Type’ decides if the calculation is done in the RGB (Red Green Blue) or HSB (Hue Saturation Brightness) model.	Image Layer 1 	Image Layer 2 Resulting Output Image

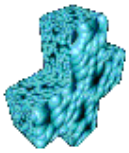
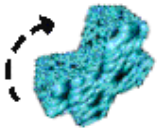
Layer Features and Attributes	Example with values in %	
Colorboost (ColBoost-R; -G; -B)	ColBoost (50,50,50)	ColBoost (0,0,**100**)
Manipulate the intensity of red, green or blue color of the image seperately.		

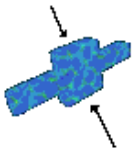
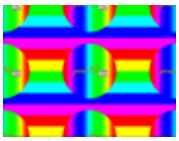
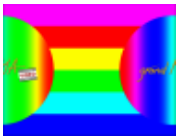
Borders

Borders (Left Hard, Left Soft, Right Hard…Top Hard, Top Soft)	soft borders	hard borders
Borders can be used for realizing PiP (picture in picture) applications. Softborder works with alpha channels so that the layer underneath can even shine through the top layer to merge the layers. For example first cut the layer to a smaller size (which is NOT scaling!) and then create a soft edge by using the soft parameter for the respective side of the layer. This makes the layer underneath shine through (see picture).		

Layer Features and Attributes	Example with values in %	
	Video	
VObj (3D-Object)	cross	sphere
Select an 2D or 3D object on which surface the image or video is shown		

Layer Features and Attributes	Example with values in %	
VObj (I-Pool)	Pool ‚**Standard**' selected	Pool ‚**Video Test2'** selected
Selection of the 'I-Pool'. One ‚Pool' can contain up to 255 images or videos		
VObj (Images)	Image **1**	Image **2**
Choose the image or video from the selected 'Pool'		
VObj (Output) Choose output for the layer e.g. the layer 1 is only visible on output 1		
VPos (X; Y; Z ; Scale) Scale modifies the range of X ;Y ;Z	X= **50%**; Y=**50%**; Z=**50%**	X=**25%**; Y=**25%**; Z=**25%**
Positioning of the projection object in X; Y; Z - direction		
VRot (X; Y; Z)	X=40%; Y=**60%**; Z=**50%**	X=40%; Y=**40%**; Z=**40%**
Rotate the projection object around the X; Y; and Z-axis		

Layer Features and Attributes	Example with values in %	
VPos <> (X; Y;Z)	X= **50%**; Y=50%; Z=50%	X= **60%**; Y=**60%**; Z=50%
Animate continuous moving of the projection object in X; Y and Z - direction		
VRot <> (X; Y;Z)	X= 50%; Y=50%; Z=**50%**	X= 50%; Y=50%; Z=**60%**
Animate continuous rotation of the object around the X; Y and Z - axis		

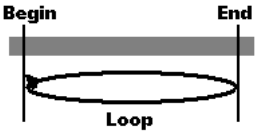
Layer Features and Attributes	Example with values in %	
VScale (X; Y; Z ; All)	X= 50%; Y=**50%**; Z=50%	X= 50%; Y=**30%**; Z=50%
Scale the dimensions of the object in X; Y ;Z direction		
VImg (Split X; Split Y)	Split **X 0**; Split **Y 0**	Split **X 2**; Split **Y 2**
Split the image or video in X and Y		
VImg (Offset X; Offset Y)	Offset **X=0**; Offset Y=0	Offset **X=50%**; Offset Y=0%
Offset of the image or video		
VImg<> (X; Y)	X= **50%** Y=50%;Z=50%	X= **60%** Y=50%; Z=50%
Animate continuous scrolling of the image or video on the object		

Layer Features and Attributes	Example with values in %	
VPlayer (Playmode Speed; Begin; End; Index) (Only for videos)	Frame **100**	Frame **200**

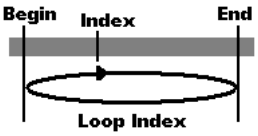
Playmodes:

Frame Index: Select a single frame with the Index channel
Play: Starts the Video once forward from the beginning to the end
Stop: Stops immediately
Pause: Pauses
Resume: Continues after Pause (even with the Looping)
Play Index: Plays the video from the indexes frame which has to be set first

Loop: Starts the video endless looped forward from the beginning

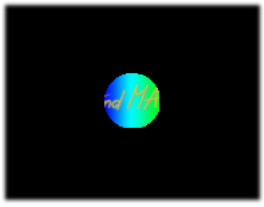
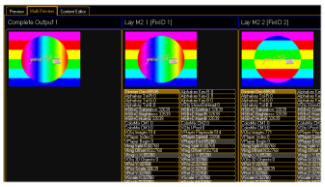


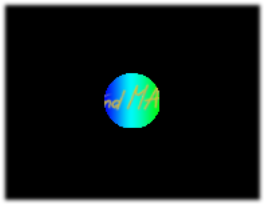
Loop Index: Loops around the frames index which has to be set first



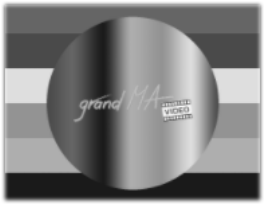
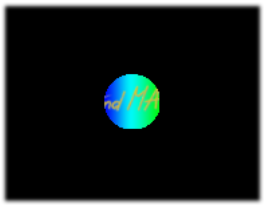
VPlayer (Speed)
modify the playback speed
VPlayer (Begin)
Set an inpoint
VPlayer (End)
Set an outpoint
VPlayer (Index)
Select a frame index

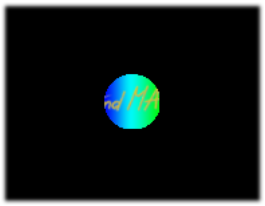
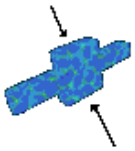
Layer Features and Attributes	Example with values in %	
VEffect 1…4 (Eff Type; Eff Part)	Eff Type = 0	Eff Type = Sepia
Several effects based on the Direct3D standard can be selected. Effects are defined within .fx files as described in 7.7.3 Content: Eff1 Type…Eff4 Type.		
Sound (Volume)	SndVol = **0%**	SndVol = **100%**
Control the sound output for video files with a soundtrack	Sound is off	Sound is on

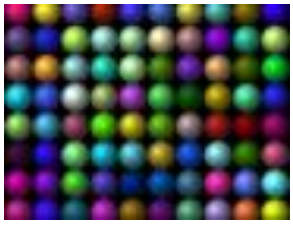
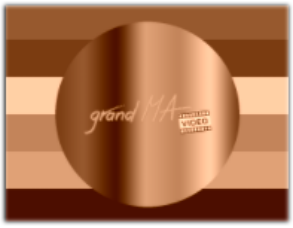
Master Features and Attributes	**Example Fullscreen View**	
	Beam	
Iris (Iris)	Iris = 10 %	Iris = 80%
Open or close the Iris		
	Control	
Control (CTRL)	Multi Preview	Fullscreen View
The Control channel of the Master Layer is used to switch to the Fullscreen View or to shut down the VPU via the desk. These functions are available as buttons in the Smart View: - No Operation: --- - Shutdown: Shutdown VPU - Restart: Restart VPU - Fullscreen: GUI off - Windowed: GUI on - Sniffer Mode: Sniffer mode (only GMA 1) - Slave Mode: Slave Mode (only GMA 1) - Enter PM: Start Pixelmapper - Leave PM: Leave Pixel Mapper - Clear cache		

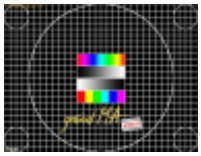
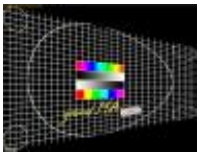
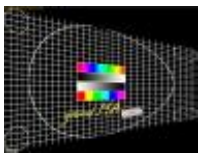
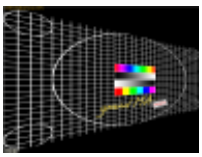
Master Features and Attributes	**Example Fullscreen View**	
	Shapers	
Shaper (1A; 1B; 2A; 2B; 3A; 3B; 4A; 4B Blades)	1A=**0**; 1B=0; 2A=**0**; 2B=0; 3A=**0**; 3B=0; 4A=**0**; 4B=0 %	1A=**30**; 1B=0; 2A=**30**; 2B=0; 3A=**30**; 3B=0; 4A=**30**; 4B=0 %
With the beam shapers the resulting image can be masked variable with four shapers each with 2 channels A and B. With the Blade switch shapers can be switched on or off.		
	Video	
VObj (Image)	Image = no Image	Image = Circle
Select the image for the iris mask		

Note: Camera effects manipulate the complete output signal:

Camera Features and Attributes	Example with values in %	
	Color	
Colorboost (ColBoost-R; -G; -B)	ColBoost (50,50,50)	ColBoost (0,0,**100**)
Manipulate the intensity of red, green or blue color of the image seperately.		
HSBC (**H**ue **S**aturation **B**rightness + **C**ontrast)	SBC (0,50,50,50)	SBC(0,0,50,50)
Set, Hue (position in the color space), Saturation, Brightness and Contrast of a layer		
	Beam	
Iris (Iris)	Iris = 10 %	Iris = 80%
Open or close the Iris		

Camera Features and Attributes	Example with values in %	
	Shapers	
Shaper1 (1A; 1B; 2A; 2B; 3A; 3B; 4A; 4B)	1A=**0**; 1B=0; 2A=**0**; 2B=0; 3A=**0**; 3B=0; 4A=**0**; 4B=0 %	1A=**30**; 1B=0; 2A=**30**; 2B=0; 3A=**30**; 3B=0; 4A=**30**; 4B=0 %
With the beam shapers the resulting image can be masked variable with four shapers each with 2 channels A and B		
	Video	
VObj (Images)	Image = no Image	Image = Circle
Select the image for the iris mask		
VScale (X; Y; Z ; All)	X= 50%; Y=**50%**; Z=50%	X= 50%; Y=**30%**; Z=50%
Scale the dimensions of the object in X; Y ;Z direction		
VImg (Split X; Y Offset X; Y)	Split **X 0**; Split **Y 0**	Split **X 2**; Split **Y 2**
Split the image in X and Y Split offset of the image. This offset can be understood as the Point of View (PoV). By using this function the perspective doesn´t change. Try this with the cube and you will clearly see the difference!		

Camera Features and Attributes	Example with values in %	
VCamPos (X; Y; Z) All layer views are mixed up to one view for the main cameras whose images are send to the physical outputs. These imaginary cameras can be moved to show only parts of the whole image. So several applications can be connected together to project a huge image. If the camera position moves the perspective changes: Take a cube, rotate it a bit and then move the camera. You can see that the perspective changes - you can see that the „world´s“center is still the centre of your monitor.	X=**50%**;Y=**50%**;Z=**50%** 	X=**46%**;Y=**52%**;Z=**54%**
VEffect 1…4 (Eff Type; Eff Part) Several effects based on the Direct3D standard can be selected. Effects are defined within .fx files as described in 7.7.3 Content: Eff1 Type…Eff4 Type. **3D Key** (PosX;Y;Z Rot X;Y;Z Scale X;Y;Z; All) Select a 3D object for the camera. This is useful to manipulate the complete output e.g. for projecting on a cyclorama or display all layers on a sphere.	Eff Type = 0 	Eff Type = Sepia 

Camera Features and Attributes	Example with values in %	
Keystone (1A,; 1B; 2A; 2B; 3A; 3B; 4A; 4B)	1A=0; 1B=0; 2A=0; 2B=**0**; 3A=0; 3B=0; 4A=0; 4B=**0** %	1A=0; 1B=0; 2A=0; 2B=**30**; 3A=0; 3B=0; 4A=0; 4B=**30** %
All layer views are mixed up to one view for the main camera. Each edge of this view can be moved towards the opposite edge to generate a keystone effect.		
Keystone Corr. (Corr X.; Corr Y)	X Corr. = **0 %**; Y Corr. = 0 %	X Corr. = **75 %**; Y Corr. = 0 %
If a picture is projected distorted on a surface, a perspective correction is necessary to distribute the content on the surface correctly. Therefore the distribution of the picture content can be manipulated in X- and Y-direction.		

Camera Features and Attributes	Example with values in %	
Softedge (1A,; 1B; 2A; 2B; 3A; 3B; 4A; 4B)	1A=0; 1B=0; 2A=**0**; 2B=0; 3A=0; 3B=0; 4A=0; 4B=0 %	1A=0; 1B=0; 2A=**50**; 2B=0; 3A=0; 3B=0; 4A=0; 4B=0 %

If several projectors should show one common image, the borders must be cross faded. For every border one channel for the position and one channel for the dispensation of the black wedge exist. This example shows a soft edging for the left border of the image.

Splitscreen (Offset X; Offset Y)

Changing the X or Y offset doesn't change the point of view. Camera axis stays on the object axis. This is different from VCamPos.

8.1 Order of Effect Execution

Effects are executed in the following range (top-down):

- Texture Color
- Color Key
- Effects (SW or Sepia or stuff like that)
- RGB Values (**R**ed **G**reen **B**lue)
- Color Boost
- Saturation
- Contrast
- Brightness
- Dimmer
- Alpha

9 Softedging

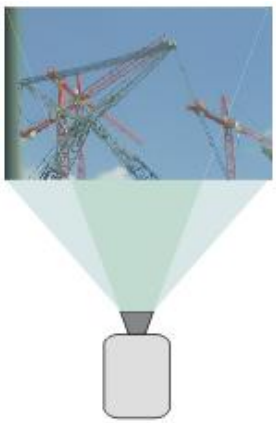
Softedging or Soft Edge Blending is a technique to split a complete picture into several smaller tiles. Therefore the margins of the flanking edges overlap. Inside the overlapping range both images show the same content, but with decreasing brightness to the boarders. MA VPU supports this technique for videos and images. This is realized via four controllable grayscales (gray wedges) at the borders of the image. Position and distribution of the grayscale are controlled by the grandMA desk with each two channels:

Left Tile

Projector 1

Softedge controlling of the left image with Shaper 14A ;14B

Right Tile



Projector 2

Softedge controlling of the right image with Shaper 12A; 12B

Projection of the complete Image

The following example shows the functionality of the Softedge control channels:

Out Layer Softedge
Shaper 12A = **0 %**
Shaper 12B = 0%

Out Layer Softedge
Shaper 12A = **100 %**
Shaper 12B = **0%**

Out Layer Softedge
Shaper 12A = 100 %
Shaper 12B = **50%**

10 Keystoning

If a projector is parallel to the screen, the image is a right-angled plane.

If the projector is shifted horizontally or vertically the right-angled projection gets trapezoid.

This effect is called Keystoning.

Original image

Distorted Projection

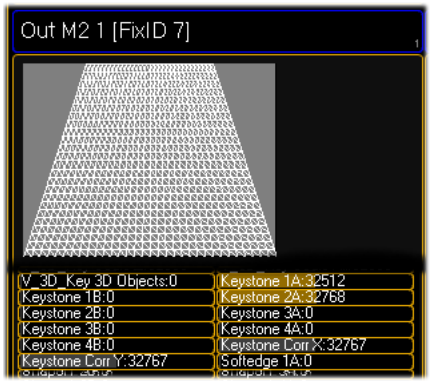
(tilt upward)

This effect can be minimized by using the Keystone Correction.

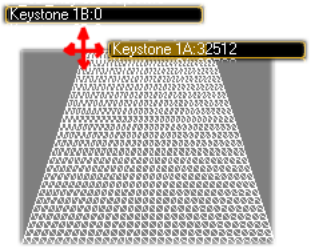
Keystone Correction recalculates the image that it is shown right-angled independent of the position of the projector. Therefore the pixels must be compressed and the image is made smaller.

Pay attention, the Keystone Correction always causes a compression of the projected image. This causes a loss of quality of your projection.

This correction is done in Camera Layer Fixture:



For every edge of the image 1…4 there exists two control channels (Keystone 1A-1B…Keystone 4A-4B). With these channels the edges can be moved in horizontal and vertical direction:



Channels Keystone. X and Y are for the distribution of the picture content in X and Y direction.

The resulting output image for this distorted Keystone Layer looks like the image beside.

11 Pixelmapper

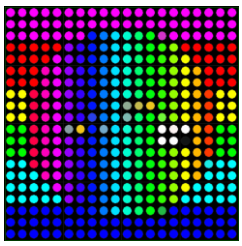
The Pixelmapper allows the presentation of the video output to a DMX matrix. DMX data is sent directly from the MA VPU PC via Ethernet using the Artnet protocol.

The LED wall can be configured individually using several LED panels from different manufacturers. The operating on the desk is analog to the operating of a video wall.

LED Panels are defined similar to dimmer or multi function spots via fixture type text files. These files are located on the video PC in the default path:
C:\Program Files\MA Lighting Technologies\MA VPU\NEWPANELS
Here the properties of the LED panels are defined as a Fixture Types in single files (grandMA Serieies1: PanelName.txt).

The following example shows a test image mapped on a 20 x 20 LED wall

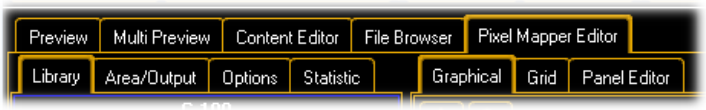
Test image original



Mapping on a 20 x 20 LED Wall

Switch to the Pixelmapper mode via the menu: ‘Mode – Pixelmapper’ or touchscreen ‘Setup – Pixelmapper’. (Touch Screen: Setup – Pixelmapper)

After the activation of the Pixelmapper an extra tabbed window ‘Pixelmapper Editor’ appears. The general output of MA VPU is now done via the Ethernet protocol Artnet instead of the graphic card of the PC.



11.1 Pixelmapper Graphical View

This view presents the graphical LED wall arrangement and allows a comfortable editing and controlling of the used panels:

Zooming allows seeing all DMX addresses and panel names. Markers for the left upper corner of a panel are scaled on a percentage basis.
When zooming in a certain area, the centre stays in the area the user is zooming in/out via scrolling.
Once you have zoomed out and want to zoom in again, the centre will be in the middle of the area but then you can select what ever part of the area and zoom in again without loosing position information.
When entering the Pixelmapper the area will automatically be scaled so that you can see the complete area.
All units are in [meter].
In whatever mouse mode you are (Select, Zoom or New) there are 2 buttons in the upper left corner in the graphical editor:
View Move and View Zoom. Just press and hold those buttons and you can move the area or zoom in/out.

ViewMove: Click and hold this button and then move the mouse to move the area.

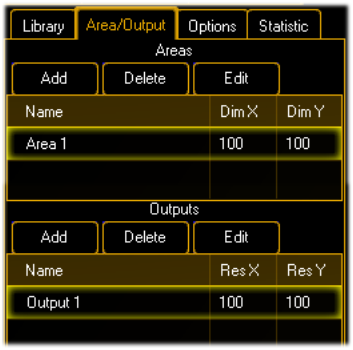
ViewZoom: Click and hold this button and then move the mouse to zoom in/out the area.

11.1.1 Pixelmapper Toolbar

Center	Shows the center of the Pixelmapper Editor
Autofit	Zooms the Editor automatically so that all panels are visible.
Select	If this button is selected, **single LED fixtures** can be selected to arrange them inside the LED wall or show their attributes via a right mouse click.
Zoom	**Zoom** the render window to fit. **Zoom in** with the right mouse button **Zoom out** with shift + right mouse button
New	If a rectangle is drawn up while holding the right mouse button down in the right window, this rectangle will be automatically equipped with the necessary number of the selected panels. See 11.4 Setup of an LED Wall
Delete	**Delete** the selected LED panel.
Undo	**Undo** the last action
Prev	Select the previous panel
Next	Select the next panel

11.1.2 Pixelmapper Editor

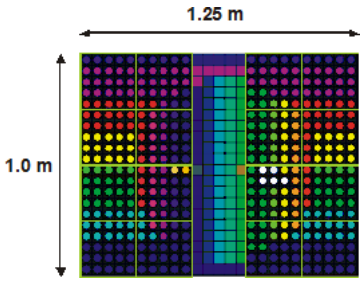
Library:
On the left side of the window all configured default LED panels are shown. By double clicking you can open the folders to see the panels.
You can change the width of the window by selecting the border and move the mouse holding the left mouse button down.
If a panel is selected in the lower part, a detailed view of the panel is shown in the upper part.
To edit this file do a double click the icon, the panel will be opened in the Panel Editor and can be edited there.
The pop-up menu of the preview offers the LED simulation of a panel that has been selected in the graphical window and the indication of the Universe/DMX addresses.



Area/Output: The general output of MA VPU is done now via the Ethernet protocol Artnet instead of the graphic card of the PC. Therefore the physical dimensions of the LED matrix (Area) and the number of pixels (Output) can be set:

Area: Here the physical width and height of the LED matrix is determined. This must not be conform to the whole size of the LED Panels. So e.g. only sub ranges of the general view of the LED Panels can be set. The units are set via the dialog of the menu entry, Options – Pixelmapper' The area is definend in n * m cm.

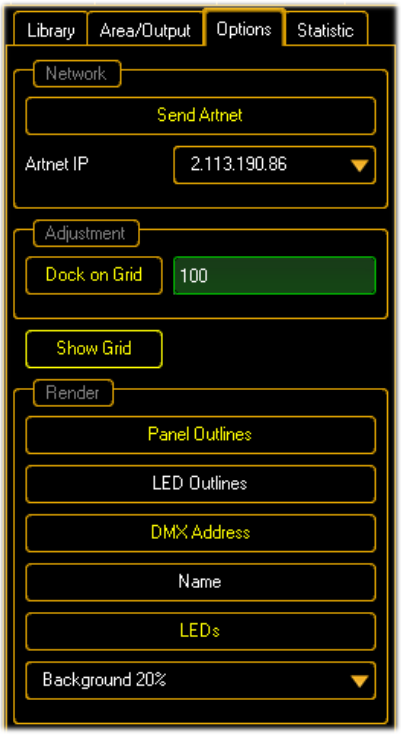
Output: Mapping of the whole output to the Artnet output range. The output range is defined in n x m pixel.



Example: The physical dimensions of the source picture must not confirm to the whole size of the Panels. The LED Panels can display, for example only a sub range of the whole output.

In this example the area size is
1,25m x 1,0 m with 25 x 20 pixel.

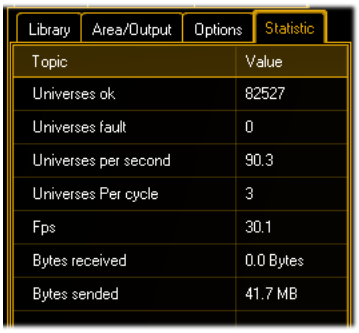
There are only 16 panels used (5 x 5 LEDs). The middle stripe is not equipped with LED Panels and is not used.



Options:
Send Artnet : Enable sending data sending to the Artnet IP that is selected in the dropdown field.

Grid: Displays a grid with n lines in X and Y direction where you can align the panels. Aright click in the graphical view displays the option 'Dock on Grid' to automatically dock all panels on the grid.

Panel Outlines: Marks the panel borders.
LED Outlines: Marks the LED borders.
DMX Addresses: Show the universe + DMX start addresses of each panel.
Name: Display the fixture name of each panel.
LEDs: Preview content for each LED.
Background: If the part of the output area is not equipped with a panel, the background image is indicated transparent. Select the transparency.



Statistic:
This tab offers information about the used universes, DMX channels and the performance .

11.2 Pixelmapper Grid View

Via the tab 'Grid View' you can switch to the Grid View of the Pixelmapper:

This view offers an overview about all used LED panels. All values can be edited directly in the grid. Selected panels are displayed bold.
You can use common functions like:

Multiselection: select first row while pressing <Shift> and select last row (still hold <Shift>)--> all rows inbetween are selected. Select or deselect several rows by pressing Ctrl. Press F2 for editing a value and all selected values will take over the new value.
Selecting multiple values can also be done by using the rubberband, means to lasso a certain area.
The edit control (to type in the value) directly opens after relaesing the mouse when selection is done.
Holding <Ctrl> while lassoing (selecting) values allows toggling the selection.
The selection of several rows (multiselection) is indicated as shown in the graphis below. All green highlighted values will take over the new value.

Copy & Paste from an Excel Sheet:
Note: you can only do this on a Media PC or on a external PC running the VPU Software. If you want to use the functionality in combination with a VPU, this external PC has to be in a

session with the VPU or the same showfile that you just edited. It has to be uploaded to the VPU afterwards. Create an Excel sheet that fits the options in the VPU, change all cells to the desired values:

	A	B	C	D	E	F	G	H
1	Index	Universe	Address	X[m]	Y[m]	Rot[°]	Paneltype	Name
2	0	50	1	0,2	3	25	C100	Circle 1
3	1	53	1	0,3	3	25	C100	Circle 1
4	2	56	1	0,4	3	25	C100	Circle 1
5	3	59	1	0,5	3	25	C100	Circle 1
6	4	62	1	0,6	3	25	C100	Door 4
7	5	65	1	0,7	3	25	C100	Door 4
8	6	68	1	0,8	3	25	C100	Door 4
9	7	71	1	0,9	3	25	C100	Door 4
10	8	74	1	1	3	25	C100	Door 4
11	9	77	1	1,1	3	25	C100	Door 4
12	10	80	1	1,2	3	25	C100	Door 4

Copy these settings to the clipboard by pressing CTRL + C (only values shall be selected, not the headline, numerical values comma separated, so e.g. only values like “2,3” are valid. Open the VPU software; go to the grid view in the pixel mapper mode. Select the row, where you want to insert new values:

Index	Universe	Address	X [m]	Y [m]	Rot°	Paneltype	Name
0	**1**	**1**	**0.500 [m]**	**39.500 [m]**	**0.0 [°]**	**C 100**	**PM Fixture 0**
1	3	241	1.500 [m]	39.500 [m]	0.0 [°]	C 100	PM Fixture 1
2	5	481	2.500 [m]	39.500 [m]	0.0 [°]	C 100	PM Fixture 2
3	8	209	3.500 [m]	39.500 [m]	0.0 [°]	C 100	PM Fixture 3
4	10	449	4.500 [m]	39.500 [m]	0.0 [°]	C 100	PM Fixture 4
5	13	177	5.500 [m]	39.500 [m]	0.0 [°]	C 100	PM Fixture 5
6	15	417	6.500 [m]	39.500 [m]	0.0 [°]	C 100	PM Fixture 6

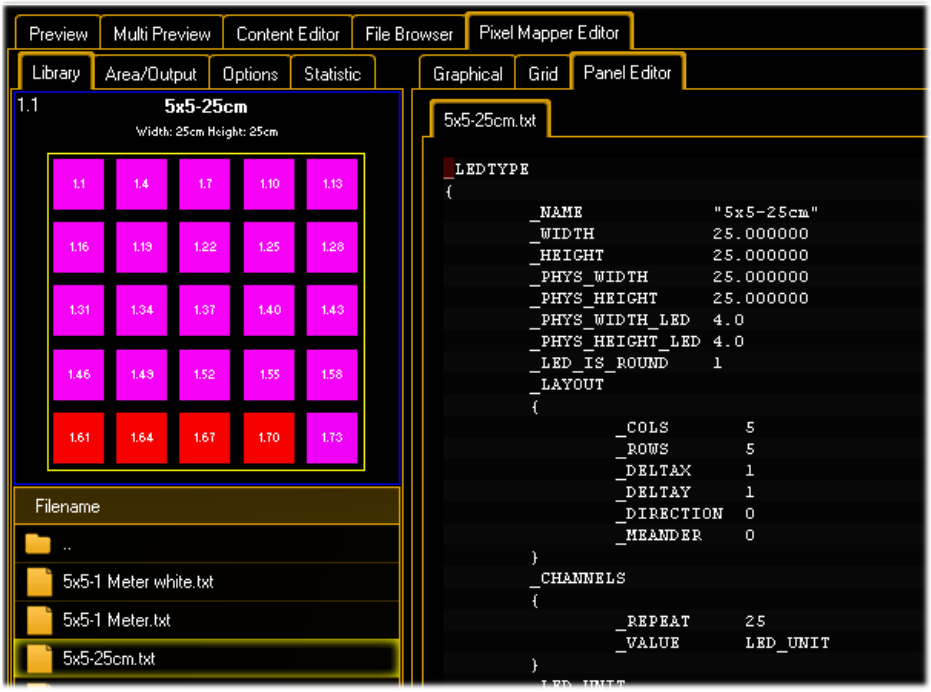
Right click into the grid view and select “Paste”. The result looks like this:

Index	Universe	Address	X [m]	Y [m]	Rot°	Paneltype	Name
0	**50**	**1**	**0.200 [m]**	**3.000 [m]**	**25.0 [°]**	**C 100**	**Circle 1**
1	53	1	0.300 [m]	3.000 [m]	25.0 [°]	C 100	Circle 1
2	56	1	0.400 [m]	3.000 [m]	25.0 [°]	C 100	Circle 1
3	59	1	0.500 [m]	3.000 [m]	25.0 [°]	C 100	Circle 1
4	62	1	0.600 [m]	3.000 [m]	25.0 [°]	C 100	Door 4
5	65	1	0.700 [m]	3.000 [m]	25.0 [°]	C 100	Door 4
6	68	1	0.800 [m]	3.000 [m]	25.0 [°]	C 100	Door 4
7	71	1	0.900 [m]	3.000 [m]	25.0 [°]	C 100	Door 4
8	74	1	1.000 [m]	3.000 [m]	25.0 [°]	C 100	Door 4
9	77	1	1.100 [m]	3.000 [m]	25.0 [°]	C 100	Door 4
10	80	1	1.200 [m]	3.000 [m]	25.0 [°]	C 100	Door 4
11	28	81	11.500 [m]	39.500 [m]	0.0 [°]	C 100	PM Fixture 11

You cannot change the index or the Paneltype. If you select e.g. only Universe and Address in the Excel Sheet (and copy that into the clibboard), then set the marker in the cell from where you want to change the values and you paste this information into the VPU software, only these values will be overwritten. So selected copy past is possible as well.

11.3 Pixelmapper Panel Editor

Via the tab ‘Panel Editor’ you can switch to the view of the Panel Editor:



A double click on a panel at the left side opens the description text file of the selected panel as text. Within this editor you can edit several panel files. Common commands like cut, copy, paste etc. are supported. Via a right mouse click you reach the commands like save, save as….

11.4 Setup of an LED Wall

An LED (wall) matrix consists of several LED panels that are arranged in a grid.

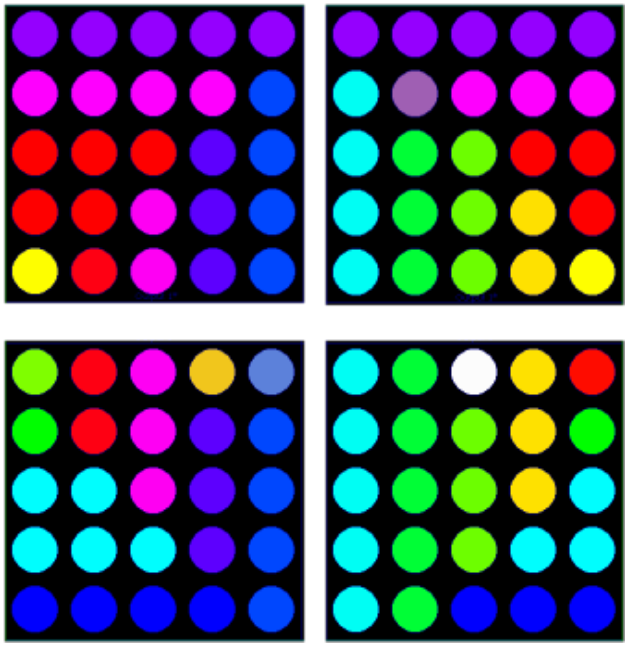
The LED matrix in the following example exists of 4 pieces 5x5 LED panels with 25 RGB chanals each.

Therefore every panel needs 25 x 3 = 75 DMX channels.

In the example each panel is assigned to an individual DMX universe.

Panel 1:
Universe 1
DMX Chan. 1…75

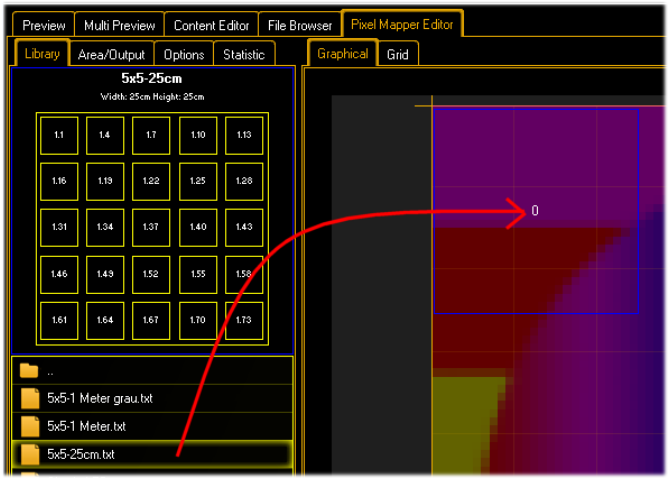
Panel 2:
Universe 2
DMX Chan. 1…75



Panel 3:
Universe 3
DMX Chan. 1…75

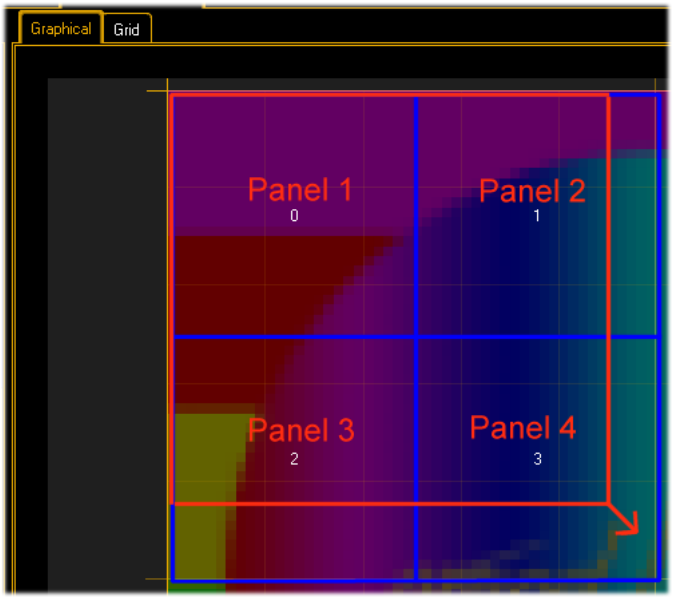
Panel 4:
Universe 4
DMX Chan. 1…75

To configure the LED wall there are two possibilities 1. or 2.:



1.
Drag the LED Panel from the left field holding the left mouse button down into the output area.

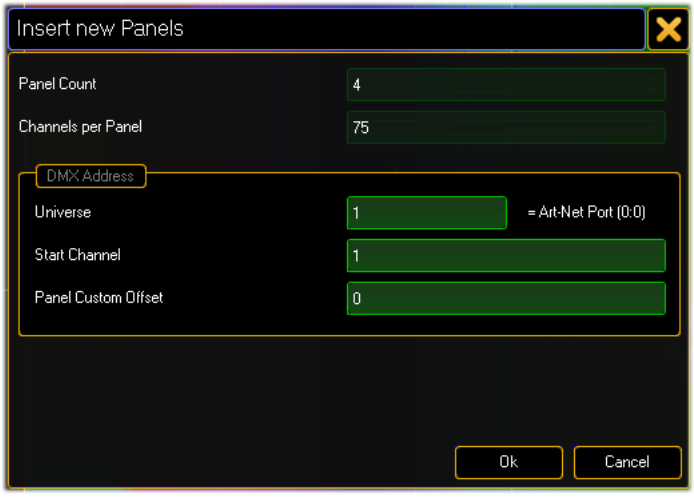
To move the panels you can use the arrow keys:
Arrow key moves:
1 grid snap
Arrow Key + Shift moves:
½ grid snaps
Arrow Key + Ctrl moves:
2.5 grid snaps



2.
Or choose the

‚New' button in the tool bar.

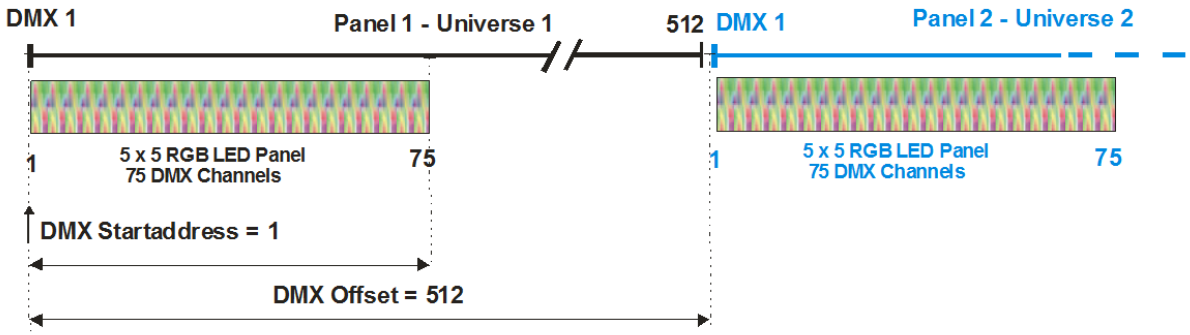
Draw a rectangle while holding the left mouse button down. Draw from the upper left down to the lower right corner diagonally. The area will be filled automatically with the necessary amount of panels.



After dropping a dialog for the DMX values appears:

Panel Count: Number LED panels.
Channels per Panel: Number of the DMX channels per panel.
Universe: Address of the first DMX universe for patching.
DMX Address: DMX start address of the first panel.
Panel Offset: Distance between the start addresses of the single panels.
For example: With the offset of 512 for each panel a new DMX universe is taken. This happens because the DMX universe range reaches from 1 to 512.

The following example shows the distribution of the DMX addresses on the DMX universes:



11.5 File Format of LED Panels

The properties of an LED panel are specified in a text file e.g. „5x5-25cm.txt“. This text files are located in the folder:

C:\ProgramFiles\MA Lighting Technologies\MA VPU Software\Data\NEWPANELS

Parallel to the text file is a bitmap (.bmp) with the same name in the folder for the visualization.

The file construction is similar to the fixture description file of the desk.

The LED panel file describes the physical dimensions of the panel, the optical visualization and the dimensions of the
LEDs as well as the DMX channels and the patching order.

The file is structured hierarchically as a tree with single blocks. The blocks are described within {}.
They contain tags (Keywords or marks) beginning with a ‘_’. A tag is followed by a set value.

Block	Tag Name	Description	Sample
_LEDTYPE {			
	_NAME	Displayed title of the LED Panel as text	5x5-25cm
	_PHYS_WIDTH	Physical width of the panel in cm	25.0
	_PHYS_HEIGHT	Physical height of the panel in cm	25.0
	_PHYS_WIDTH_LED	Physical width of one LED in cm	0.4

Block	Tag Name	Description	Sample
	_PHYS_HEIGHT_LED	Physical height of one LED in cm	0.4
	_LED_IS_ROUND	Flag for the visualization of the LED appearance (0 = false; 1 = true) Other appearances may follow. At the moment only circular or square.	1
	_LED_SHIFT_X _LED_SHIFT_Y	1=> Shift the first line / column right and the second line / column left -1=> Shift the first line / column up and the second line / column down	See the sample below: curtain
_LAYOUT {	_COLS	Amount of LED columns	5
	_ROWS	Amount of LED rows	5
	_DELTAX	Counting direction for patching: 1 – left to right -1 – right to left	1
	_DELTAY	Counting direction for patching: 1 – top down -1 – down to top	1
	_DIRECTION	Patch order: 0 – first X then Y 1 – first Y then X	0
	_MEANDER	Not supported yet	0
  }			
_CHANNELS {	_REPEAT	Count how often the following value is repeated. (Here Value = LED_UNIT 25 times)	25

Block	Tag Name	Description	Sample
	_VALUE	Patch rule for channel or following tag that is described in the following: While patching this list is processed. For each detected _VALUE = LED_UNIT a new LED_UNIT is inserted. The amount of '_COLS' multiplied with '_ROWS' complies with the number of 'SUBBLOCK' entries. If _VALUE = NONE there is an DMX gap.	LED_UNIT or NONE
}			
_LED_UNIT {	_VALUE	Function description of the channels. Valid values: CYAN, MAGENTA, YELLOW, RED, GREEN, BLUE, WHITE or 0…255 for dimmer etc.	RED
	_VALUE		GREEN
}	_VALUE		BLUE
}			

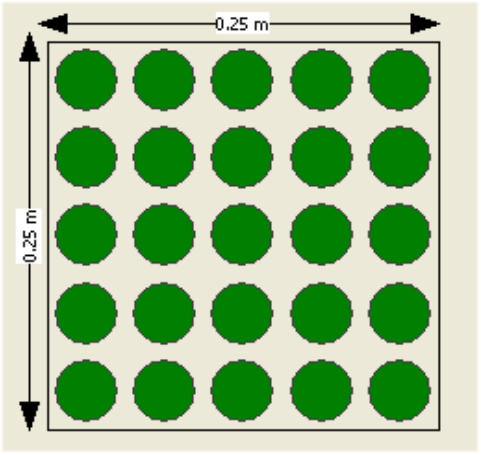
11.5.1 LED Panel Examples

Because LED Panels can take different shapes here some examples:

In the simplest case LEDs are numbered continuous:

```
_LEDTYPE
{
    _NAME          "5x5-25cm"
    _WIDTH         25.000000          5 X 5 LED Matrix
    _HEIGHT        25.000000
    _PHYS_WIDTH    25.000000
    _PHYS_HEIGHT   25.000000
    _PHYS_WIDTH_LED  4.0
```

```
        _PHYS_HEIGHT_LED 4.0
        _LED_IS_ROUND    1
        _LAYOUT
        {
              _COLS      5
              _ROWS      5
              _DELTAX    1
              _DELTAY    1
              _DIRECTION 0
              _MEANDER   0
        }
        _CHANNELS
        {
              _REPEAT    25
              _VALUE     LED_UNIT
        }
        _LED_UNIT
        {
              _VALUE     RED
              _VALUE     GREEN
              _VALUE     BLUE
        }
}
```



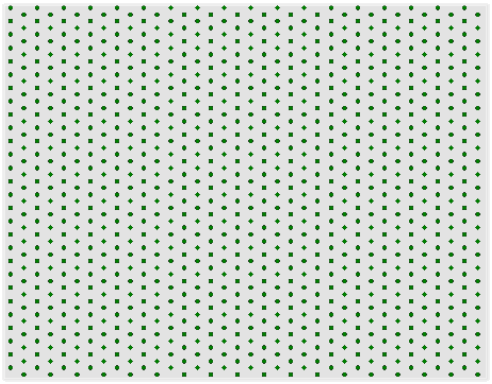
LED Curtain, LEDs have an offset in Y direction:

```
_LEDTYPE
{
    _NAME            "Star Cloth"
    _PHYS_WIDTH      360.000000
    _PHYS_HEIGHT     280.000000
```

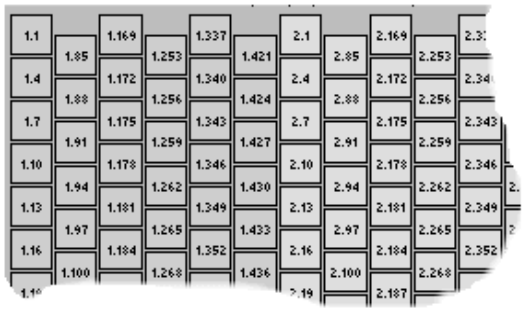
LED curtain with 3072 channels and offset in Y-direction. This offset is described by the _LED_SHIFT_Y = -1 tag.

Dimensions 3.6 m X 2.8 m

```
_PHYS_WIDTH_LED     4.000000
_PHYS_HEIGHT_LED    4.000000
_LED_IS_ROUND 1
 _LED_SHIFT_Y       -1
 _LED_SHIFT_X       0
_LAYOUT
{
    _COLS       36
    _ROWS       28
    _DELTAX     1
    _DELTAY     1
    _DIRECTION  1
    _MEANDER    0
}
_CHANNELS
{
    _REPEAT     168
    _VALUE      LED_UNIT
    _REPEAT     8
    _VALUE      NONE
    _REPEAT     168
    _VALUE      LED_UNIT
   :
   :
}
_LED_UNIT
{
    _VALUE      RED
    _VALUE      GREEN
```



Patch:

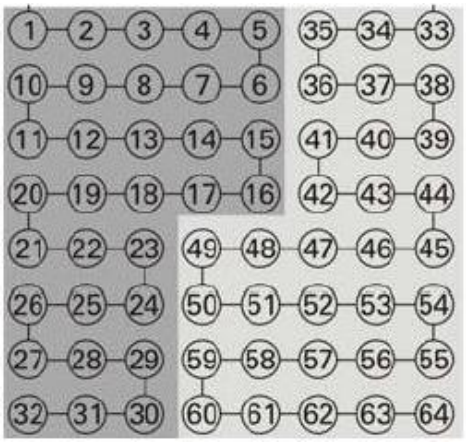


```
        _VALUE      BLUE
    }
}
```

LED Panel unusual patching

```
_LEDTYPE
{
    _NAME           "Crazy-Patch"
    _WIDTH          80.000000
    _HEIGHT         80.000000
    _PHYS_WIDTH     80.000000
    _PHYS_HEIGHT    80.000000
    _PHYS_WIDTH_LED  5.0
    _PHYS_HEIGHT_LED 5.0
    _LED_IS_ROUND    1
    _LAYOUT
    {
        _COLS      8
        _ROWS      8
        _DELTAX    1
        _DELTAY    1
        _DIRECTION  0
        _MEANDER    0
    }
    _CHANNELS
    {
        _LEDUNIT    0
        _LEDUNIT    3
        _LEDUNIT    6
        _LEDUNIT    9
```

8 x 8 LED Panel with strange DMX-Patch



_LEDUNIT 12

_LEDUNIT 102

_LEDUNIT 99

_LEDUNIT 96

_LEDUNIT 27

_LEDUNIT 24

_LEDUNIT 21

_LEDUNIT 18

_LEDUNIT 15

_LEDUNIT 105

_LEDUNIT 108

_LEDUNIT 111

etc.

12 Creation of customized 3D Objects

3D objects can be created with 3D CAD programs. Please note, that the amount of polygons affects the performance because for each polygon the projection has to be calculated. The lower the number of polygons the better is the framerate.

MA VPU supports the following formats for 3D objects:

.x – DirectX file format

.3ds – Format for drawing 3 dimensional objects

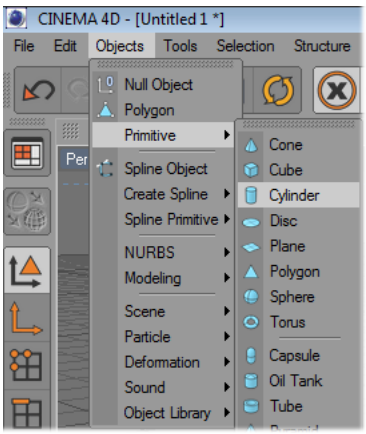
Note the following regulations:

The orientation of the object should fit

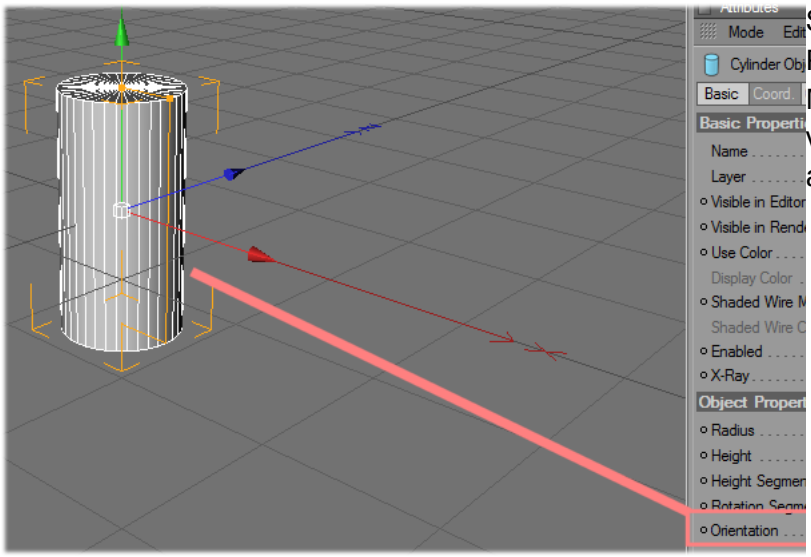
Normals have to be organized correctly

UV coordinates for the textures have to be setup correctly

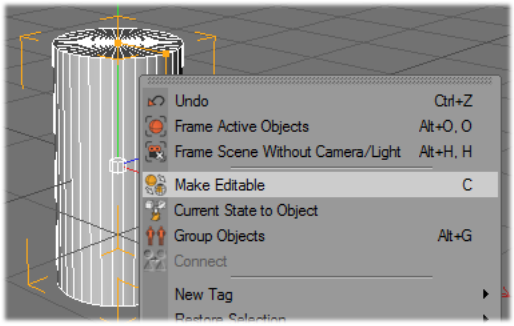
The following example shows the creation of a cylinder with the ‘Cinema 4D’ (Copyright by MAXON Computer GmbH) software.



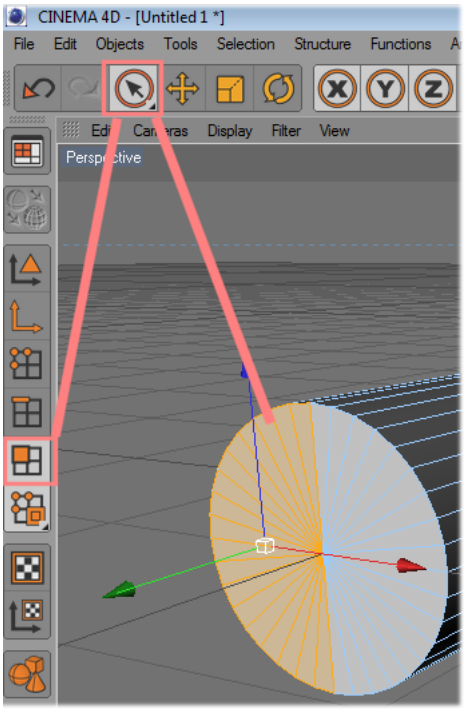
Insert an object of type ‘Cylinder’



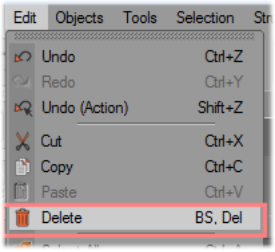
Set the orientation to ‘Y+’. For a correct visualization in MA VPU Z is the depth, Y the vertical and X the horizontal axis



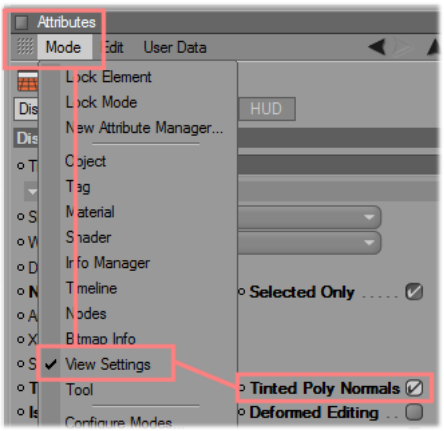
Make the object editable



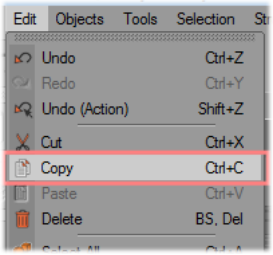
Select not used polygons…



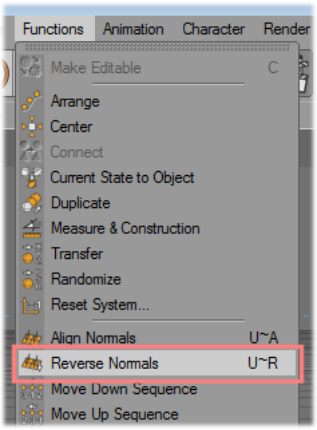
and delete them



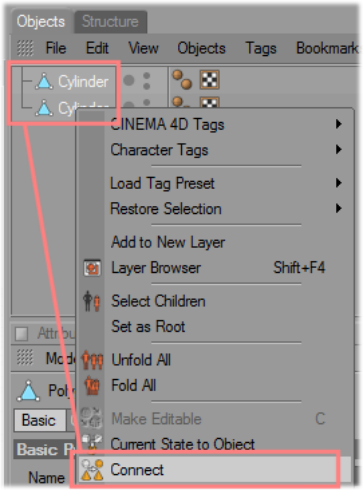
Set the visibility of normal on.



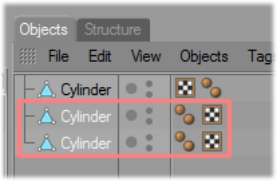
Copy the object…



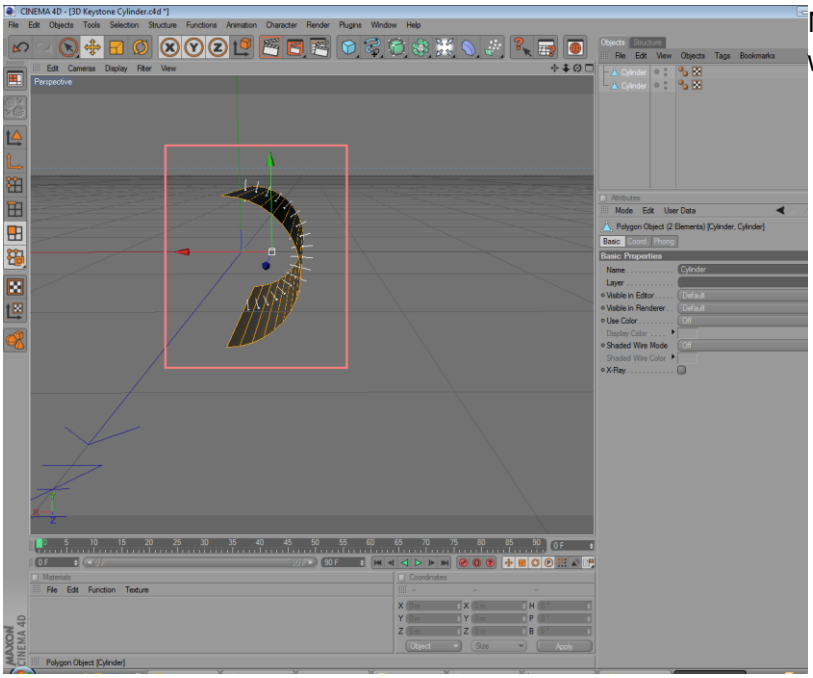
And reverse the normals of the copy.



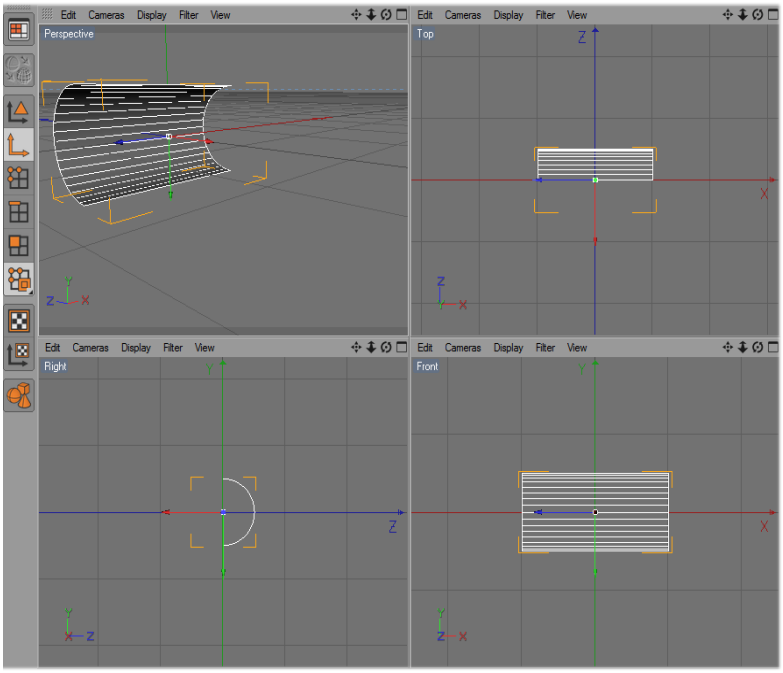
Select both cylinder objects and connect them to one new cylinder.



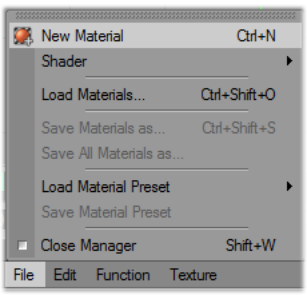
The old cylinder objects can be deleted.



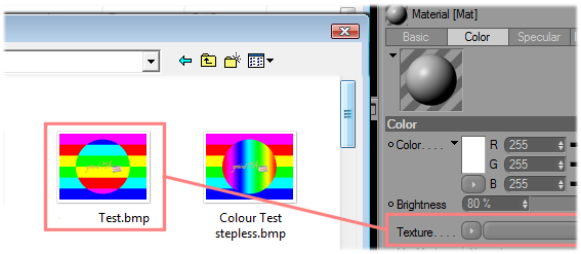
Now you can see two objects with normals in both directions



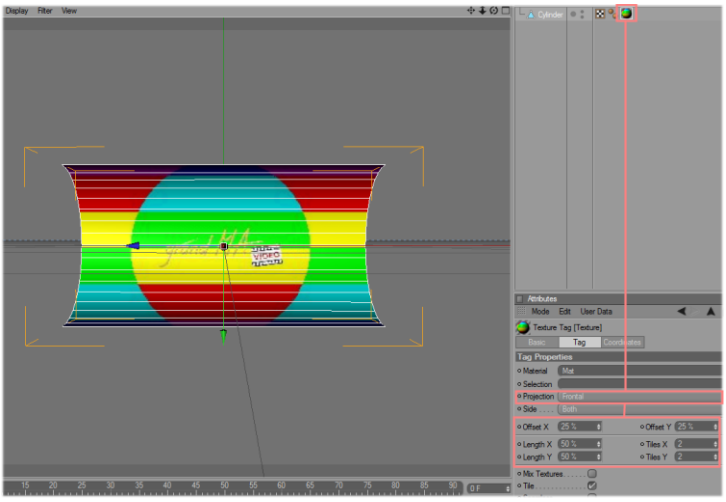
Check the orientation of the resulting object.



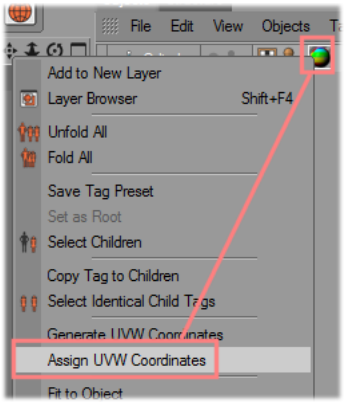
Insert a new material for the texturing.



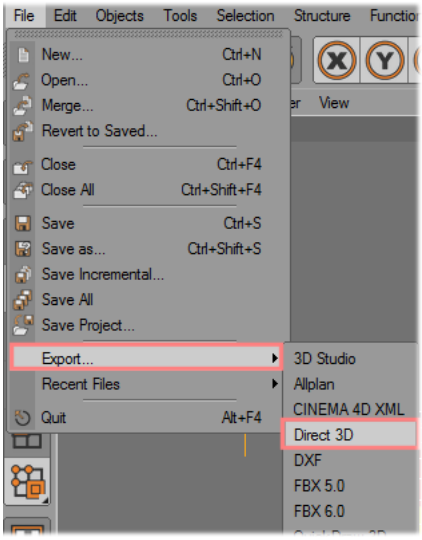
Assign an image to the texture and the material to the object.



Adjust the texture mapping parameter.



Assign the UV coordinates for the texture mapping.



Export the object to Direct 3D format.

Objects created in this way can be added to the ‚Channel Set' via the context menu in the '3D Objects' view with the right mouse button.

13 Example for the Splitting of an HD Video:

To reduce the amount of data when playing a high resolution video, the staple should be separated into several lower resolved videos.

Example: An HD video is projected with 4 video projectors:

In the simplest way we create 4 outputs, move the cameras to the appropriate tiles and assemble the resulting image via Softedging. This solution will stress the PC with a high data rate of the video file because only approx. 25% of the data is used for every video engine.

So first the video should be separated with a video program into 4 smaller files. Now every video engine can process the smaller video and the data stream will be reduced to a minimum.

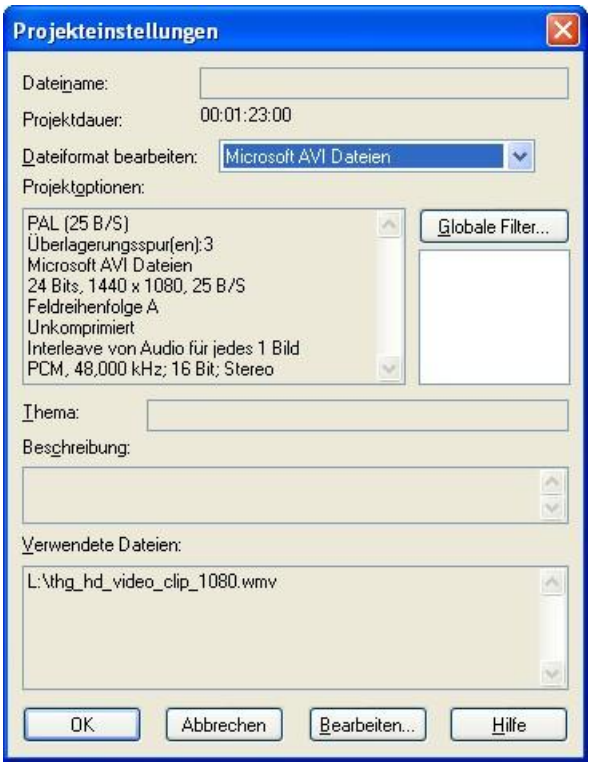
The resulting videos now have a resolution of 800 x 600 and overlap by 80 pixels for the X- and 60 pixels for the Y-direction.

Splitting a Video with ‚Ulead Media Studio Pro 7'

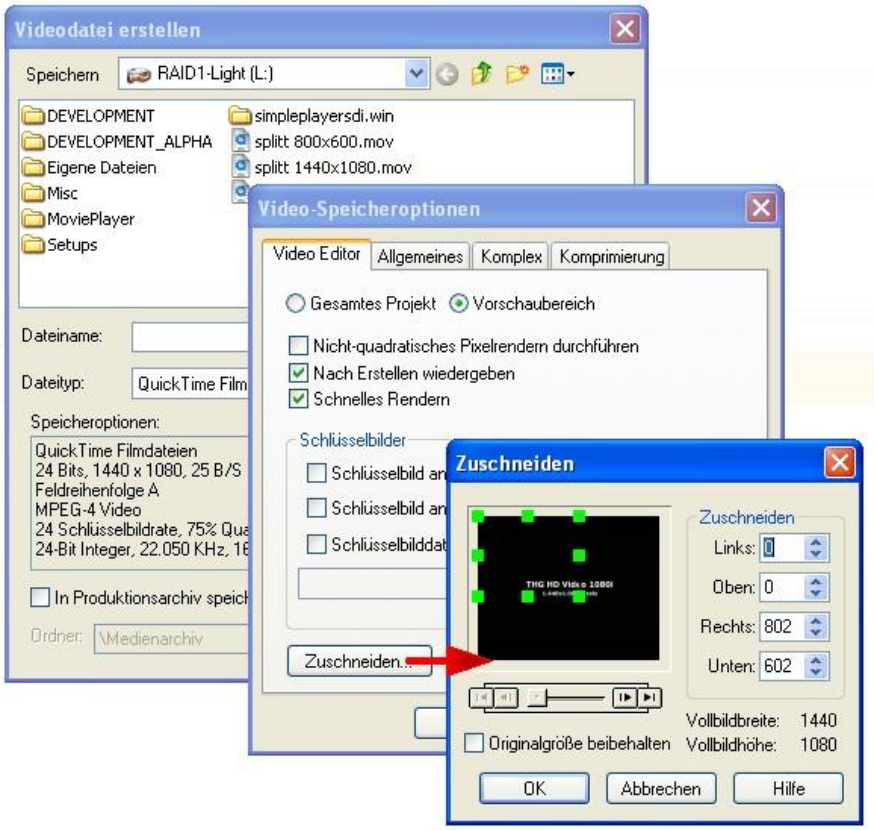
To demonstrate how the splitting of a video file can be done, this example gives a brief introduction by using the video software ‚Ulead Media Studio Pro 7'. Other applications work similar.

(Sorry for the german application surface)

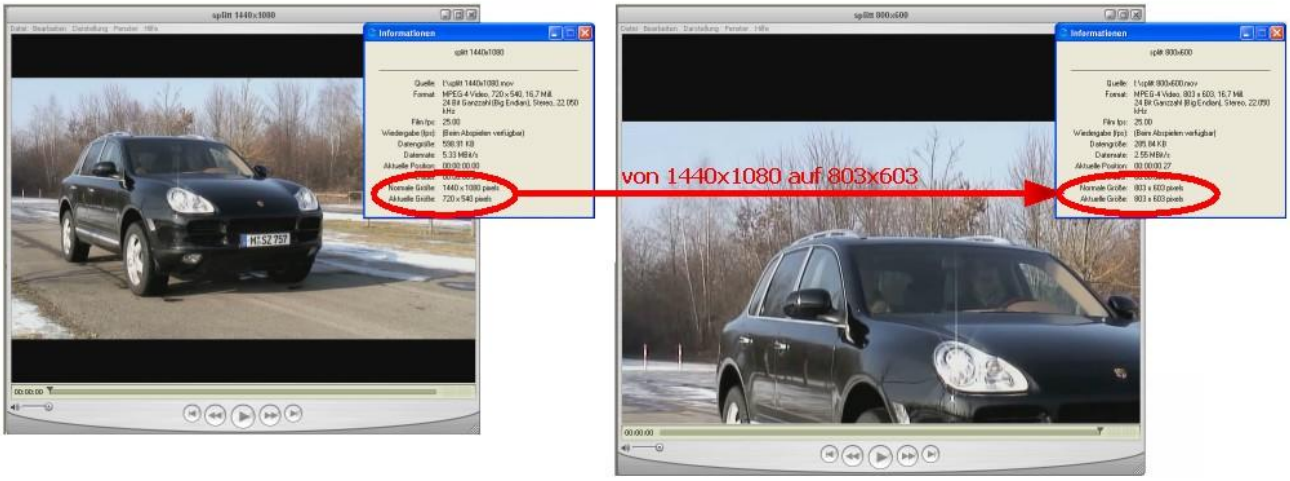
The project settings:



Create video file:



The resulting file is a separate video with the new resolution:



14 How to create a Video Loop

This is a short tutorial on how to create a video loop with the software Ulead Video Editor.

Let's assume that you just returned home from a trip and now want to create a loop from one of your recorded scenes on our tape.

Video capture:
Insert the tape which contains your video material into the camera. Rewind the tape to the start if necessary.

Connect the camera with an i-link wire to the FireWire port of your computer.

To transfer the video material with the best possible quality from the tape to the computer, make sure that your computer has a FireWire adapter.

Switch your camera to Playback Mode

Every camera has two main operational modes. One is for recording and is often called the camera mode. The second mode is the playback-mode. This mode is for watching your video in the camera or capturing (transferring) it to an external device.

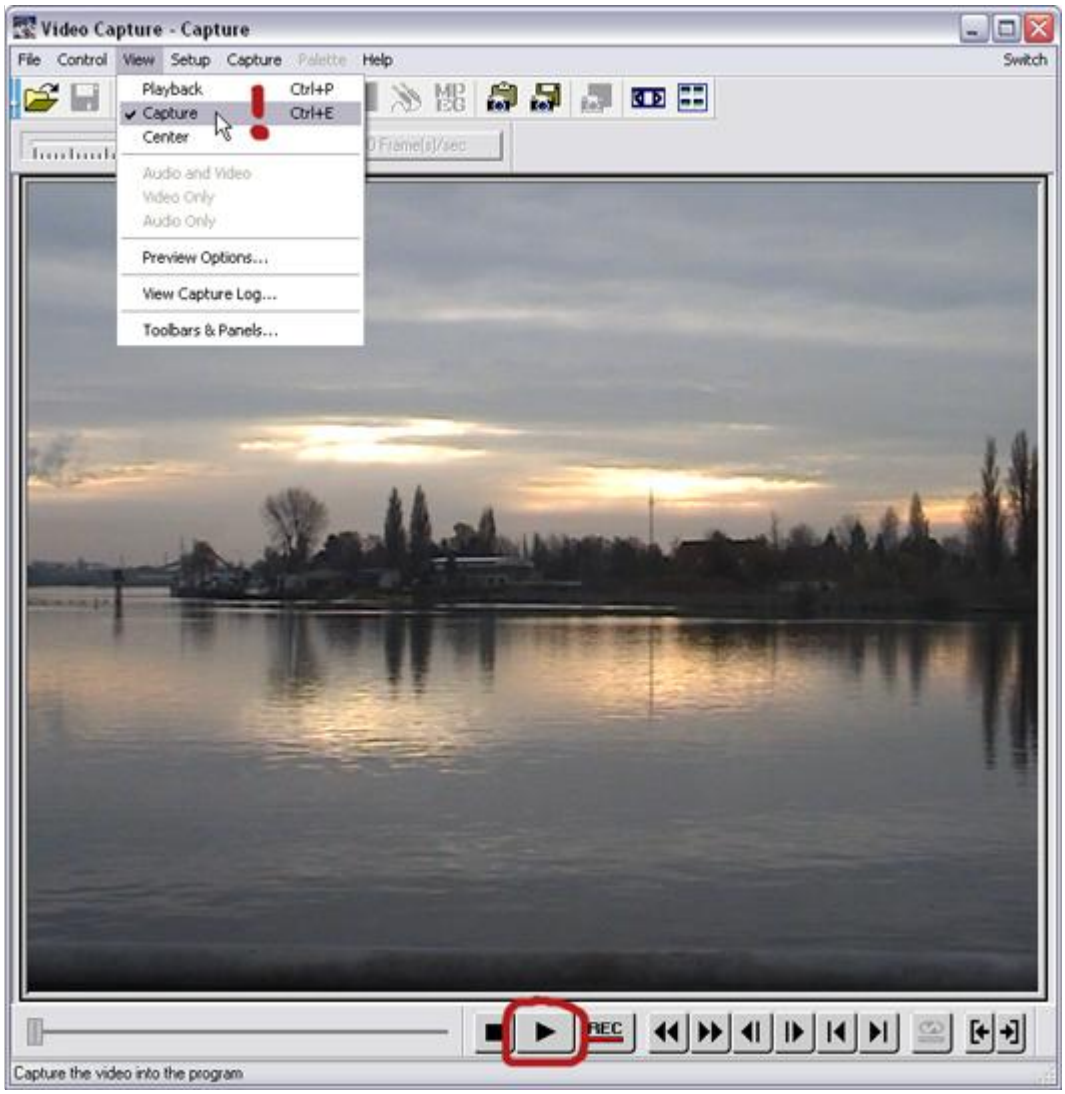
If you have any problems regarding the handling of your camera, you should look at the user operating manual for your camera.

Start the Ulead Video Capture software (Example is shows version 7.0)

Ulead divides the functions of capturing and editing video into two applications. The module which helps you to transfer the video material onto your hard drive is called Ulead Video Capture. You can find it in your start menu under the entry for Ulead Video Editor.

By now you should see an image of your tape in the main preview window.

If this isn't the case, just click the play button in the control panel in the lower screen area. Make sure that preview mode is active. You can find it at ‘menu/view’.



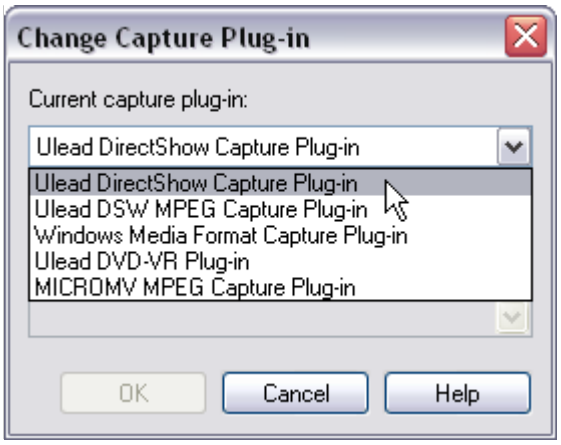
If you still see no image of your video, you have to make sure that your ‘recording-plug-in’ is configured correctly. You can do this under ‘menu/setup/recording-plug-in’.

Common types are:

Ulead VFW Recording Plug-in (for Adaptec/PAPI 1394 capture-adapters)

Ulead DirectShow Recording Plug-in (for TI 1394 capture-adapters)

Ulead DV Recording Plug-in (for other types of DV capture-adapters)



If your settings are correct, but you still see no image and many or all of the control panel-elements are not active, you have to make sure that the right entry for your camera is set under ‘menu/setup/device-control’. In most cases, this will be one of the DV-cam drivers. You can see information about the selected driver in the info field under the dropdown menu.

Now I will explain the simplest procedure: capturing one video-clip

---

Recording a single video clip

This is the easiest way to capture a single clip from tape to your hard disk.

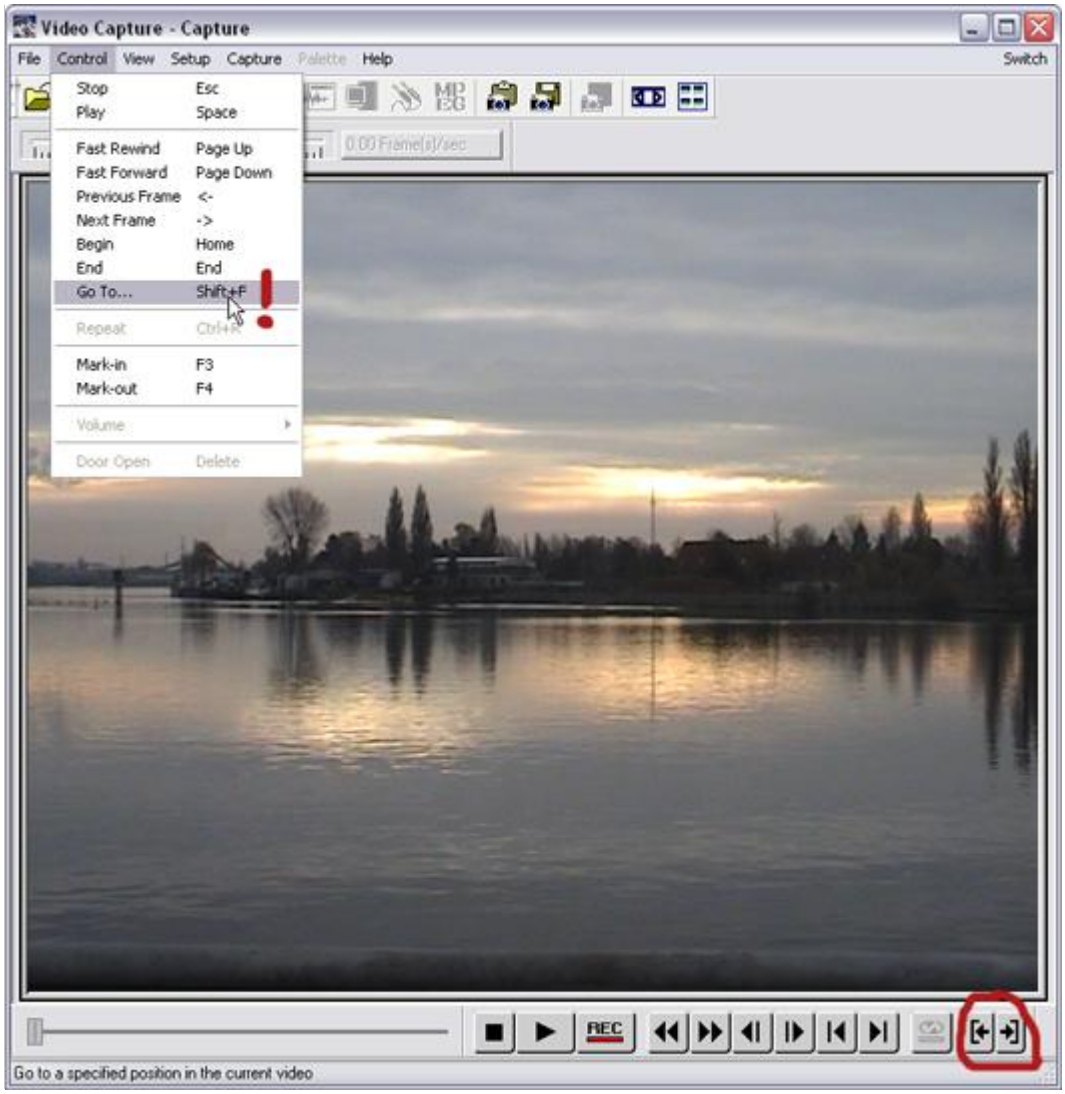
Wind your tape to the position where your clip starts.

Give your clip some extra space at the start (head) and the end (tail), because it will be safer for later editing to have a bit of overhang at the ends of the clip. From the position where your clip should start looping, wind the tape back approximately three seconds. You can trim the parts you don't want to see later in the video editor very easily.

You can see information about your position in the clip in the lower screen area. If you want to jump to an exact time, just go to ‘menu/jump to’ and enter the time you want to jump to.

Now that you have found your start position, click the ‘inpoint’ button to mark the starting point.

Repeat this step for the stopping point of your clip. Click the button for the ‘outpoint’ of the clip.



Click the Record Button in the Control Panel

Recording will not start immediately. First a dialog window pops up, where you can set some parameters. Important at the beginning are:

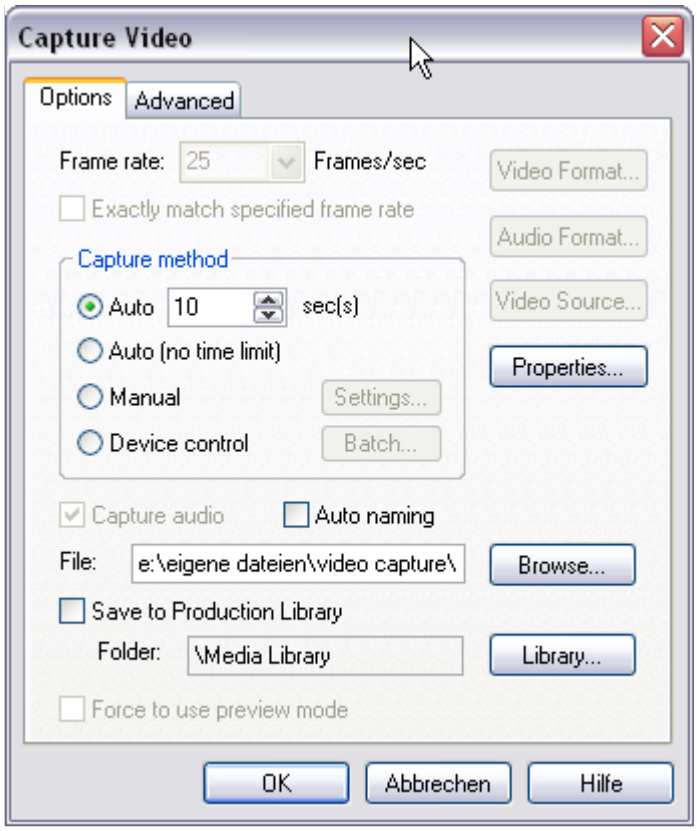
The name and local path of the video file you want to save

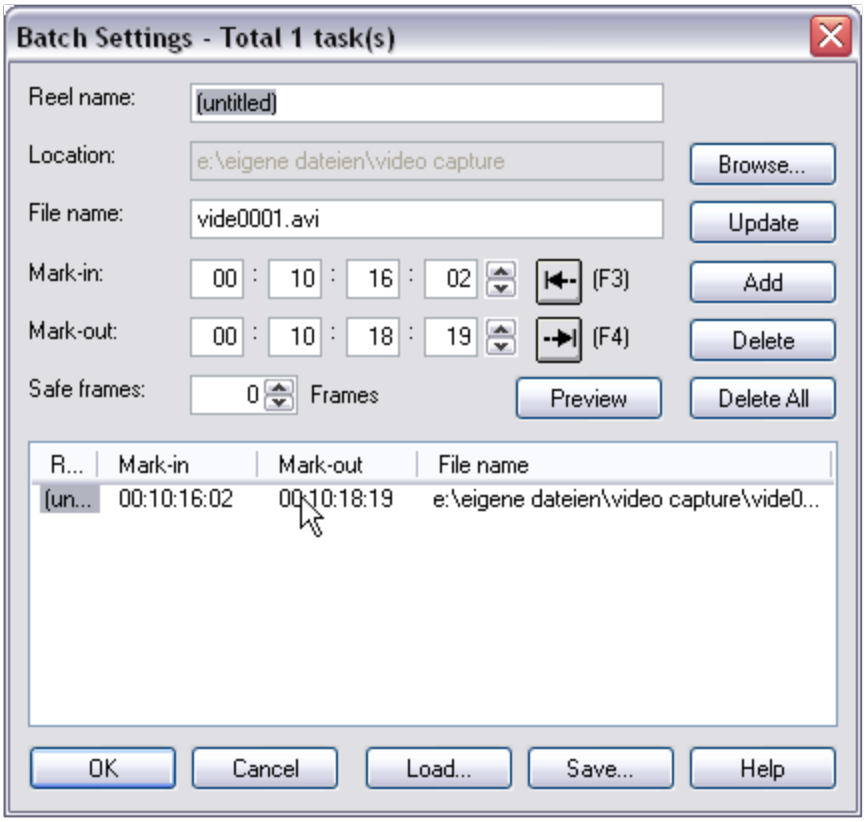
The recording methods:
Auto (with time limit): records the video from the inpoint for the specified amount of time.

Auto (no time limit): records the video, until you stop it by left-clicking the mouse or hitting ESC

device control: you can specify when the recording shall start and when it should stop, by setting an inpoint and outpoint. You can also configure batch-capturing

For this example we choose ‘device control’, because we had already set the in and outpoints. Remember? ;-). Another window opens with parameters for the recording. Check the name and the path of the file. Make sure that there is only one clip in the lower area of the window, the one which you set up.



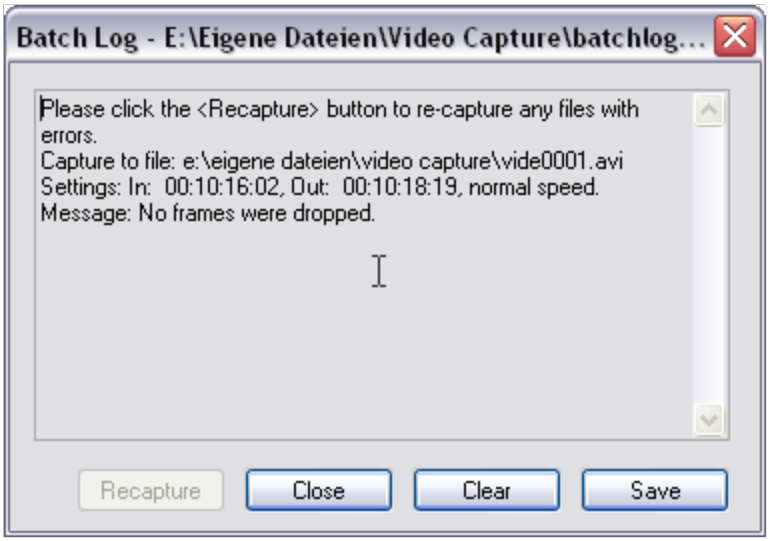


Start the recording by hitting OK.

Recording starts. You can observe the current status of the capture process in the status bar in the lower screen area.

Now you have your first clip ready for editing!

After the capturing has been finished, a message window pops up. It informs you about the result of the process. Usually everything is fine, so you can just close the window.


Batch Log - E:\Eigene Dateien\Video Capture\batchlog...
Please click the <Recapture> button to re-capture any files with errors.
Capture to file: e:\eigene dateien\video capture\vide0001.avi
Settings: In: 00:10:16:02, Out: 00:10:18:19, normal speed.
Message: No frames were dropped.
Recapture
Close
Clear
Save

If you open the folder, where you saved your clip file, you should find an avi file. This can be, depending on the length of the clip, rather big, because it is uncompressed video.

You can quit Ulead Video Capture now.

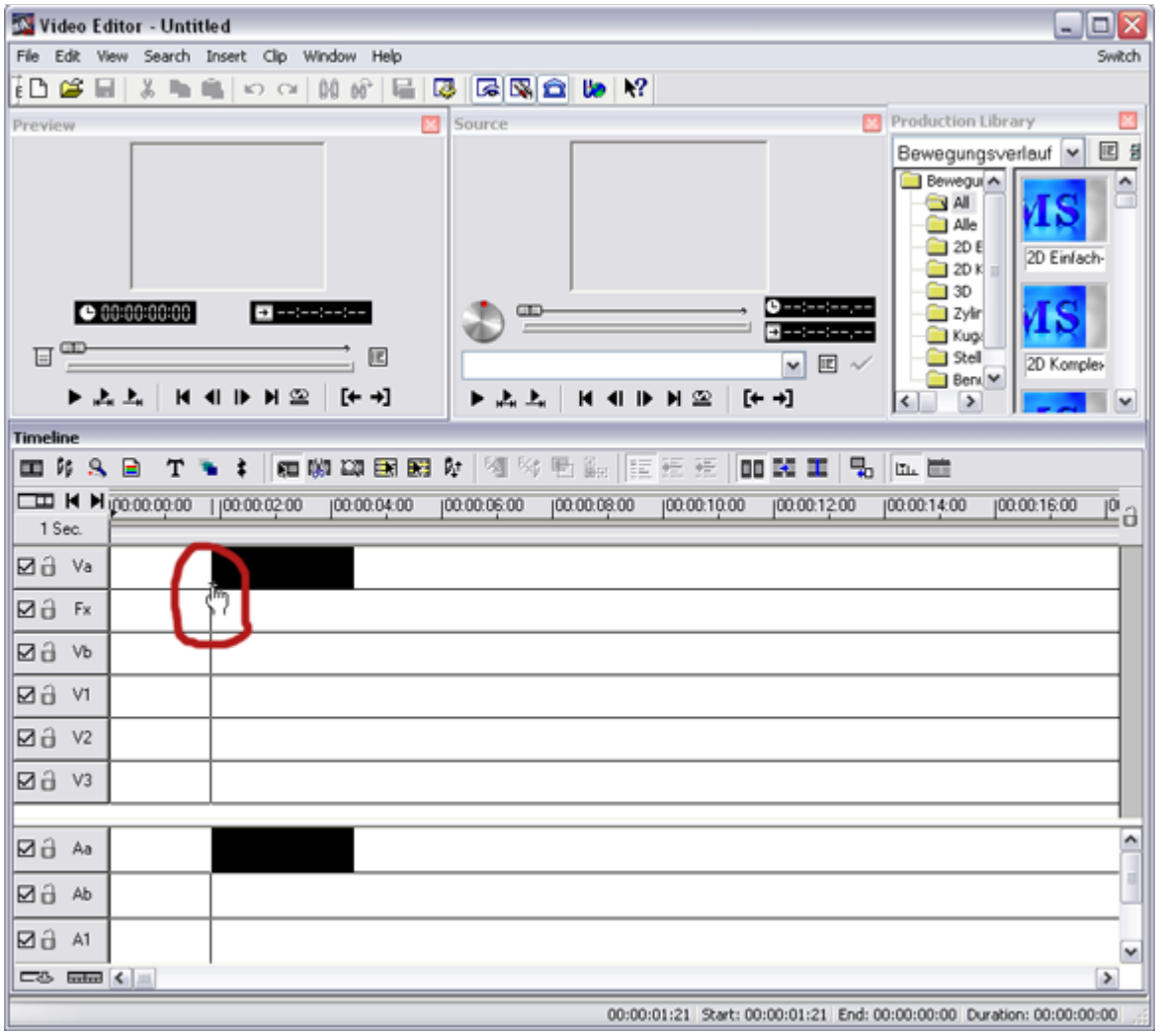
Video editing

Start the software Ulead Video Editor.

A window will pop up first, asking what kind of project you want to create. Choose DV(PAL, 25 B/S, Audio 48 kHz).

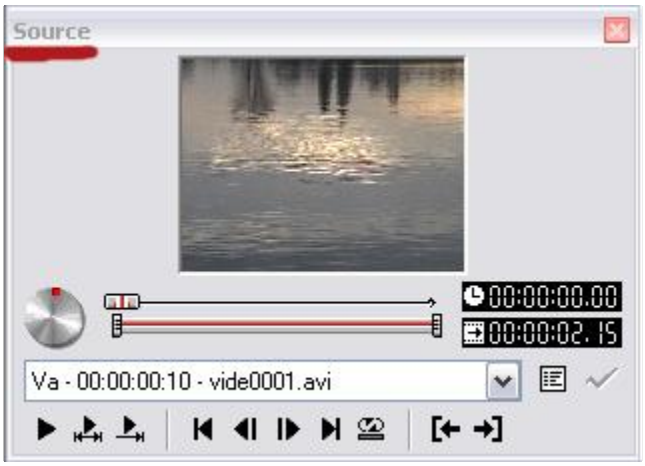
Import the previously created clip.

You can import clips by double clicking one of the video tracks in the timeline. A file-open-dialog will appear, in which you can select your clip. When you open the file, the window will disappear and the clip „becomes glued“ to your mouse pointer. Place this clip at the beginning of the first videotrack Va.



Double-click the clip in the timeline.

The clip will appear in the source window. This is, as its name indicates, the video source from which you will work, and not the clip which will be created by editing the it.



Click in the timeline above the video tracks

When you hover with the mouse pointer a bit above the video tracks, the pointer will turn into a little „star“. If you press the mouse button now and move the mouse, you will move the play head on the timeline. The upper-left preview window will change now, because it always shows the video directly under the play head.

Reduce the length of the clip to the right duration.

You know now how to view your clip in the video editor. It's very likely that the clip is not have the right length anymore. Changing the length (duration) is very simple. Move the mouse pointer over the right edge of the clip.

The mouse pointer will change into a symbol of two little arrows.

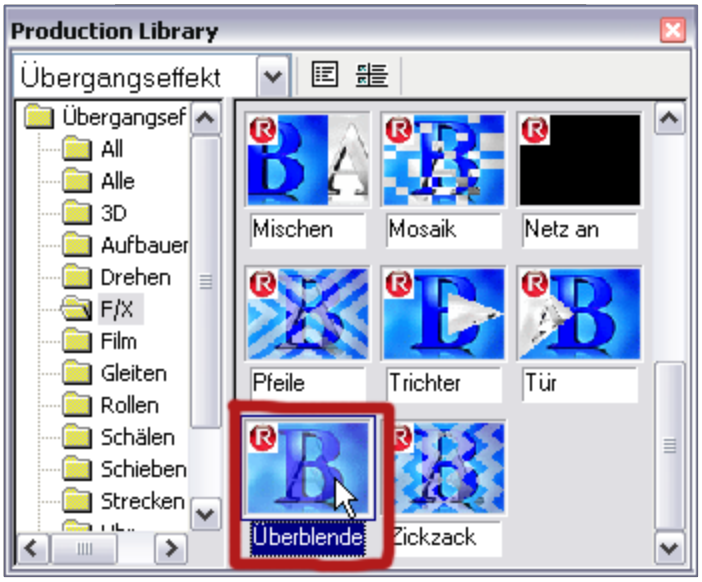
Left-click the mouse button and drag the edge of the clip toward the beginning of the clip. When you release the mouse button, you have reduced the length of the clip. It will stop now at the new end. You can do the same with the beginning of the clip.

If necessary: Move the clip back to the beginning of the video track

It is likely that you have now some spare room at the start of your clip, because you reduced its length. Drag the clip to the very beginning of the video track and drop it there. Notice that the clip will snap to the beginning of the video track.

Copy the clip and place the copy at the end of the original

Hit CTRL and left-click the clip. Drag it into the second video track Vb and place it there. Now you have created a copy of the original clip. Adjust the clip so that it starts approximately 3 seconds before the original clip ends. A cross-fade effect could later be placed in the area where both clips overlap each other.



Place a cross-fade effect between both clips

Drag the effect into the video track area. Cross fade effects can only be placed in the transition effects track. Place it right into the area where both video clips overlap. The cross fade effect will adjust its own length to the length of the overlapping area automatically. You now have created a soft cross fade from the end of the first clip into the beginning of the second.

A window pops up and gives you more options to configure the cross fade effect. But we are happy with the default-settings right now. Just click OK.

Notice that Ulead Video Editor computes the manipulated video frames each time you use an effect on the clip. This can lead to a short delay because you must wait until the application has finished rendering the new frames.

Reduce the length of the second clip

Reduce the length of the second clip until its end meets the end of the first clip. The whole movie is now as long as the first clip.

But what is the difference now?

The clip will cross fade now into its own beginning. For that we needed the copy. Now the clip is ready for a loop playback.

Save the project.

Compress and export the clip.

You can export the finished clip under ‘menu/file/create/video file’. Enter a path and a name for your file in the next dialog.

In the options section you can choose a specific compression codec, which will reduce the size of your video file significantly, though causing some loss of quality. This will help you to maintain constant playback without delays during which the video player would have to wait for new data.

You have to make a compromise here. You can get really good codecs which offer both: very good image-quality and very low file-size. However these codecs are often not free for commercial use. The DivX codec belongs in this section. But you cannot expect that this codec will be available on the target platform of your video. The worst thing that may happen is that you see a plain black rectangle instead of your clip.

You can set the output size of the video under the second tab ‘General’. Switch to „User Defined“ and enter 1024 x 768 to adjust the size to the resolution of a video projector. In the data track dropdown menu switch to ‘only video’ to drop the audio track.

Save the file with the chosen settings.

Good luck!

15 Content Specifications

General Note:

About MPEG-2:

MPEG stands for “Moving Pictures Expert Group” who created a couple of international standards. One important one is the MPEG-1/2 (ISO/IEC 13818-part x) standard which will be used for the MA VPU. As opposed to MPEG4 this standard keeps a good balance between file size and calculation power that is needed to decode the video information.

The MPEG2 standard allows a couple of settings which will highly influence the quality of the picture and the way the VPU handles this data. They are defined to be able to run several resolutions like full HD for example. That influences also the bit rate which can vary from approx. 3 to over 80 Mbit/s. The higher the bit rates the more workload for the CPU, RAM & so on. Because of that MA Lighting choose settings that form a good compromise between bit rate and resulting framerate.

To gain safe and proper performance with the VPU, we strongly encourage encoding any content as described here. Nonlinear Video Editing Systems and Compositing Tools such as Avid Composer / Adobe Premiere Pro / Adobe After Effects / Final Cut Pro do also feature high quality MPEG2 encoding tools that are very versatile and produce MPEG2 conform content. However: you have to test this content with the VPU for correct and stable performance before doing a production with this content.

If you do not know the origin and quality of the MPEG2 encodings of your content, we strongly encourage you to re-encode the complete material even if you are afraid of slightly visible artefacts. If you want to gain the best quality, use un-encoded raw video and audio material as the source.

Since Main Concept Reference can be downloaded for free to do test encodings (watermark is inserted into the video and audio is cut off after 30 seconds in the trial version), you can also use that tool to check your content by re-encoding it in case of problems related to content issues.

Video codecs other than MPEG2 are not installed on a VPU and not supported by MA Lighting. Former grandMA video dongle users that install the VPU software on their system should use a clean system and not install any other codec than the MPEG2 Decoder Pack.

You cannot gain high performance of parallel video stream decoding with guaranteed performance with not conforming and correct encoded content.

VPU content should require the following specifications:

Video + Audio	
Video Format	MPEG
Video Codec	MPEG-2
Bit Rate	Constant Bit Rate (CBR) 10 – 30 Mbps (Mega bit per Second), Variable Bit Rate (VBR) [1]
Framerate	24 fps, 25 fps, 29,97 fps, 30 fps, 50 fps, 60 fps [2]
GOP-STRUCTURE (Group of Pictures)	GOP 12, I-Frame only [3]
Container Format (without Sound)	Elementary Stream [4] or MPEG Program Stream
Container Format (with Sound)	MPEG Program Stream
Audio Stream	LPCM (uncompressed, 48 kHz, 16 Bit) or MPEG1 Layer2 (48 kHz, 384 kbps)
Color Space / Chroma Format	4:2:0
File Extension	.mpg, .mpeg, .m2v
Pixel Aspect Ratio	1:1

[1] Please note that VBR is also possible but prevents frame-exact Playback from first to last frame. We strongly recommend CBR. Please also note that the Bit rate heavily depends on the resolution of your video clip and on the content itself (e.g. lots of signal changes) Using variable bit rate (VBR) causes loop problems, so please use constant bit rate (CBR)!

[2] Please note that Framerates above 30 fps are extremely resource-consuming and will increase the performance. Use these high framerates only for specific reason.

[3].GOP 12 is possible for simple Playback without jumping within the Frames (Indexing). The more B- and P-Frames are used the higher the compression, the smaller the file size. I-Frames only is also possible but increases the data rate.

[4] Elementary Streams (ES) encoded with Main Concept Reference have the file extension. mpv. Encoded files need to be renamed into .m2v, so that the VPU can read these files.

Program Stream = contains Video and Audio files, typical file extension: mpg

Elementary Stream = contains Video or Audio files, fie extension: mpv for video data and mpa for audio data.
File names must not exceed 63 characters.
Please keep in mind: Aggressive compression (reducing the bit rate) causes loss of quality. The less signal changes and information the video sequence contains, the more you might go down with the bit rate without necessarily having visible artefacts.
Compression artefacts: Loss of edge clarity, Tone fuzziness, Blocking / contouring artefacts

Bit Rates			
Resolution	**4:3**	**16:9**	**Bit rate**
PAL	720x576		10-20 Mbps
NTSC	720x480		10-20 Mbps
VGA	640x480		10-20 Mbps
SVGA	800x600		10-20 Mbps
XGA	1024x768		15-20 Mbps
HD 720p		1280x720	15-20 Mbps
HD 1080p (not for VPU Basic)		1920x1080	20-30 Mbps

Images	
IMAGE FORMAT	**FILE EXTENSION**
Bitmap	.BMP
Portable Network Graphics	.PNG
Graphics Interchange Format	.GIF
Joint Photographic Experts Group	.JPEG, .JPG, .TGA

We recommend 32 Bit .png for Alpha Channel support. Max. 8192 x 8192 resolution for still Images.

3D Objects	
3D OBJECT FORMAT	**FILE EXTENSION**
DirectX	.X

15.1 Main Concept Reference for converting your content into MPEG2

To convert your content data (e.g. *.avi or *.mov) into the right MA VPU-format - **MPEG-2** - we recommend to use the **Main Concept Reference** transcoding tool.
The demo version of the Main Concept Reference is the base application which includes the most important Main Concept codecs in demo mode.

Please note that this is **not** preinstalled on the VPU.
The free demo version of Main Concept Reference can be downloaded here.

http://www.mainconcept.com/site/prosumer-products-4/mainconcept-reference-20373/free-demo-version-20381.html?L=0

The demo version of Main Concept Reference is fully functional, though it adds a watermark to processed video (without harming your source material). Moreover, it has an AAC Audio encoding limitation of 30 seconds. Then audio output is cut. When you are interested in obtaining the full version of the codec, you have to purchase and install the appropriate plug-in module(s) for Main Concept Reference, such as Main Concept Reference MPEG-2 (for MA VPU file format).
When you purchase the full version of a module, you will receive a serial number and a link for downloading the full version of the plug-in. The key must be entered during the modules installation. Otherwise, the full version will not be installed.

Main Concept MPEG-2 full license Plug-In is currently available for Windows, Mac/Intel and Linux.
The price for a full licence (issue Jan. 2010) is:

Price: $460 (plus appl. tax) €290 (plus appl. tax)

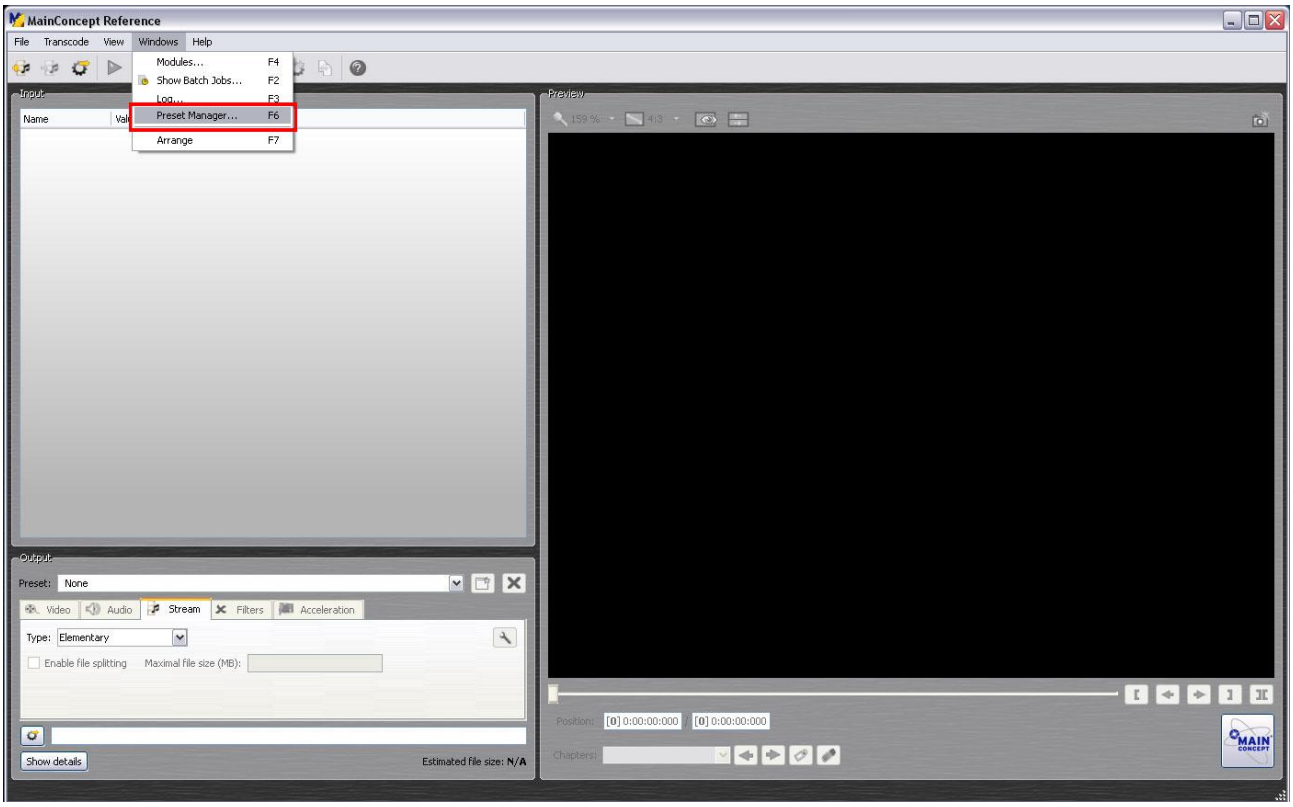
The documentation of Main Concept Reference is included in the demo version (Help / User Guide). However, it can also be downloaded separately to give you an overview of the powerful transcoding application. The high-resolution manual is available for free downloading below, in zipped Adobe® Acrobat® format. Currently, only the English version is available.

http://www.mainconcept.com/site/prosumer-products-4/mainconcept-reference-20373/manuals-20375.html?L=0

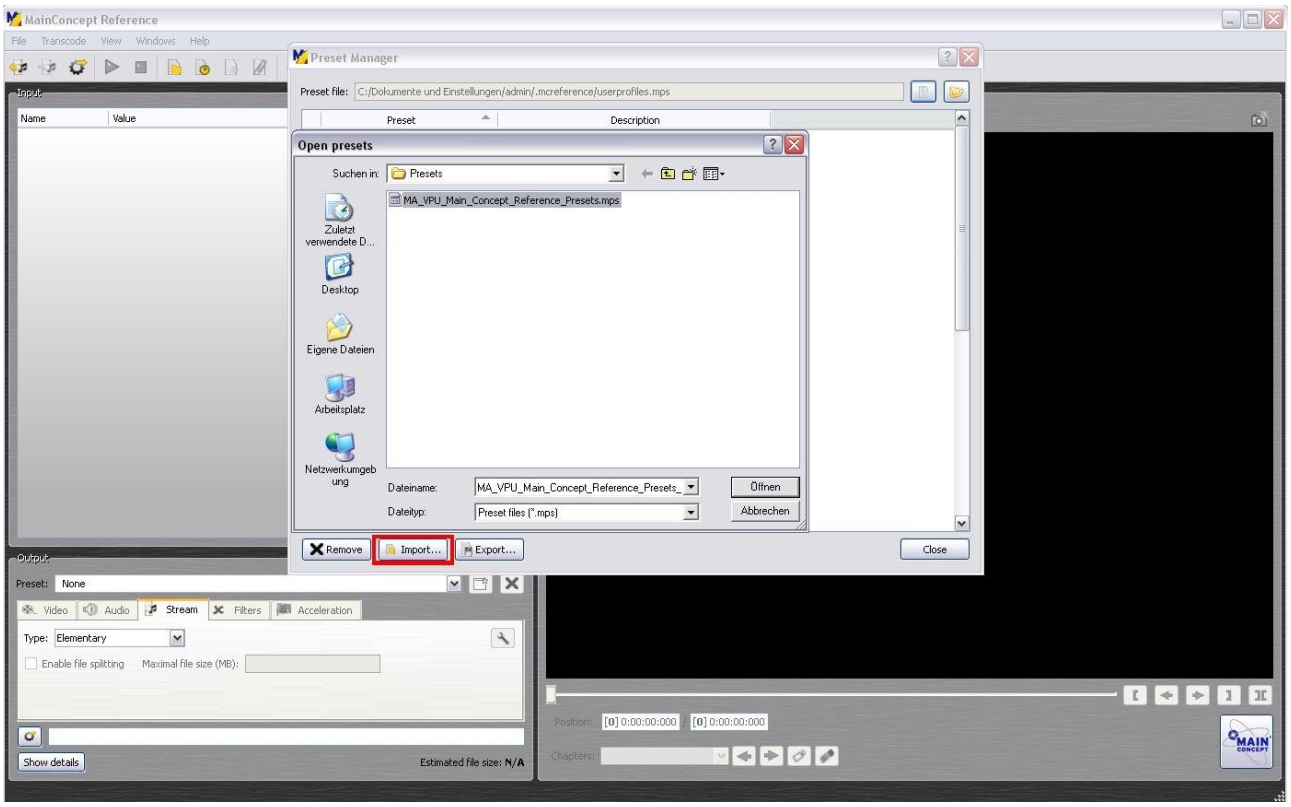
How to use Main Concept Presets

1. Run the Main Concept Reference Application

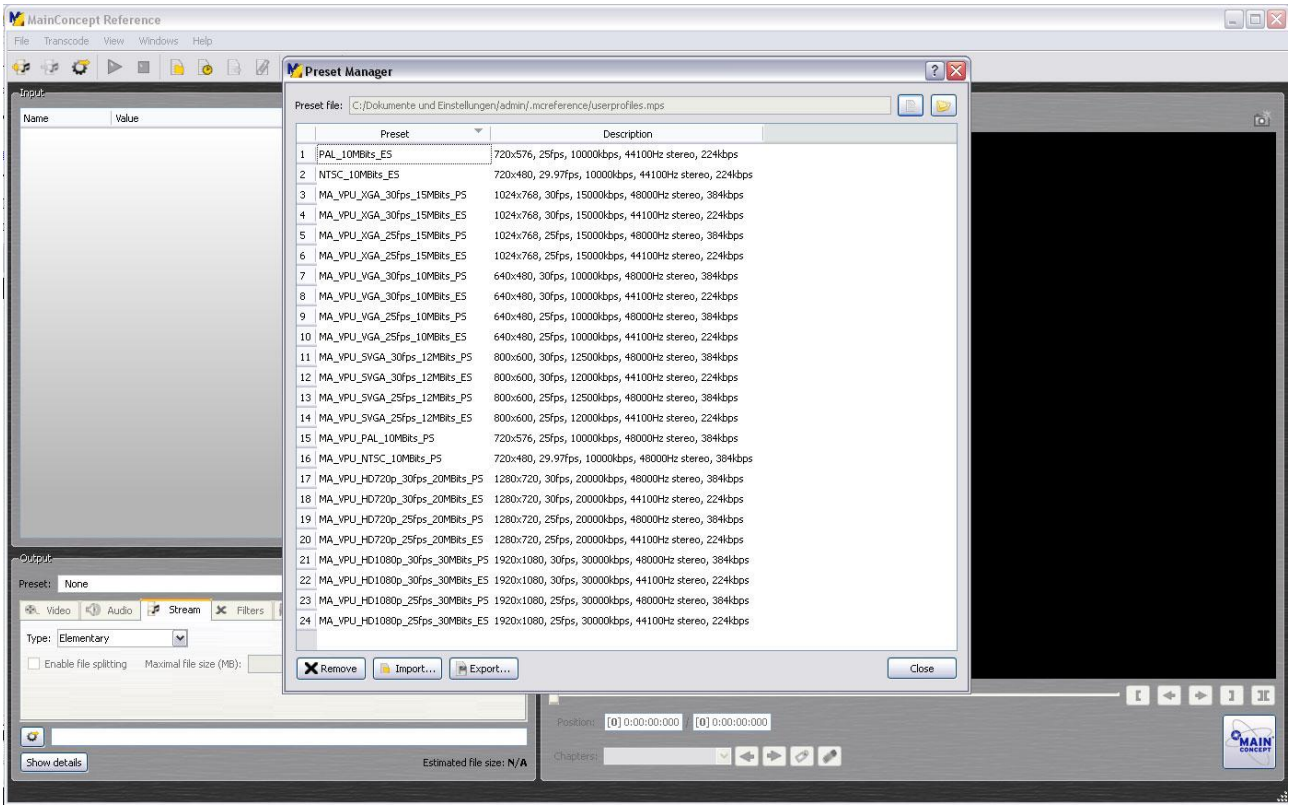
2. Open the Preset Manager: Windows/Preset Manager or Press F6



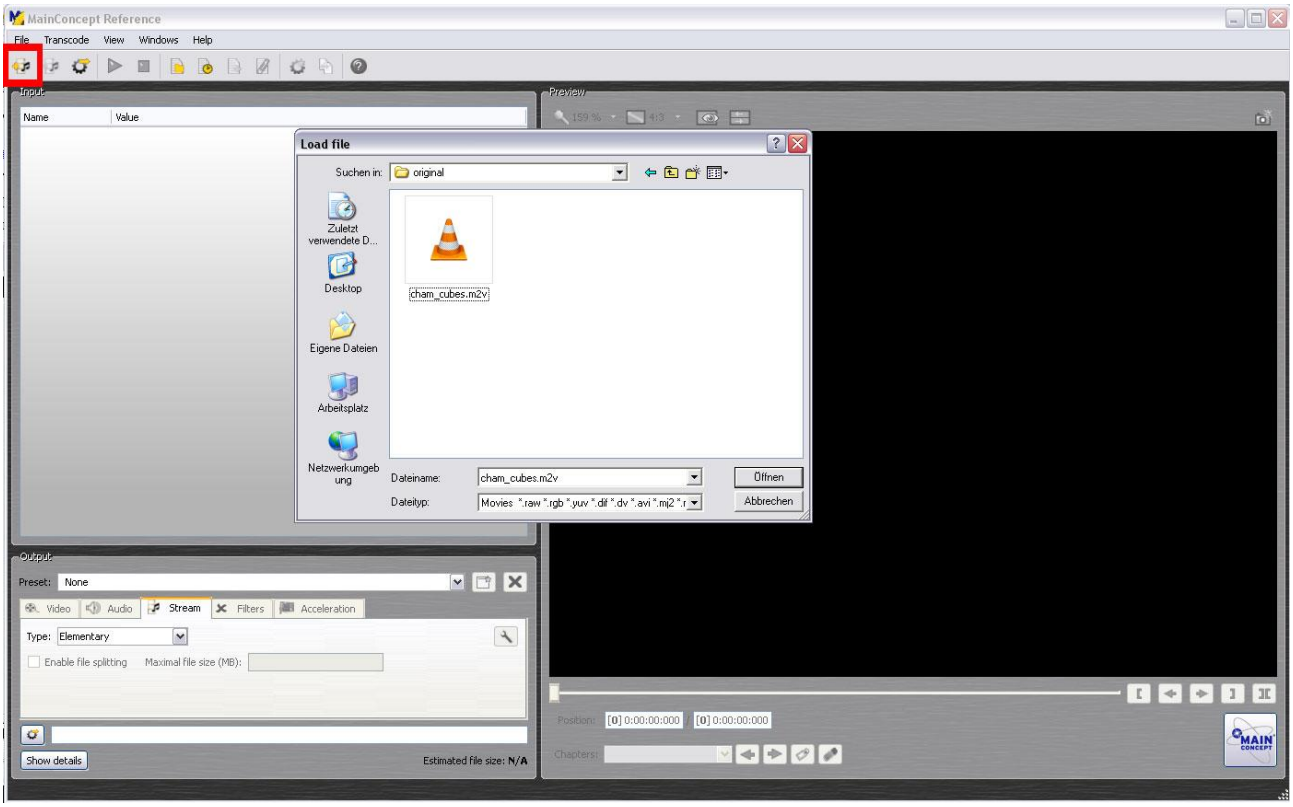
3. 3. Import Preset List „MA_VPU_Main_Concept_Reference_Presets“



4. All presets are now listed in the Preset Manager

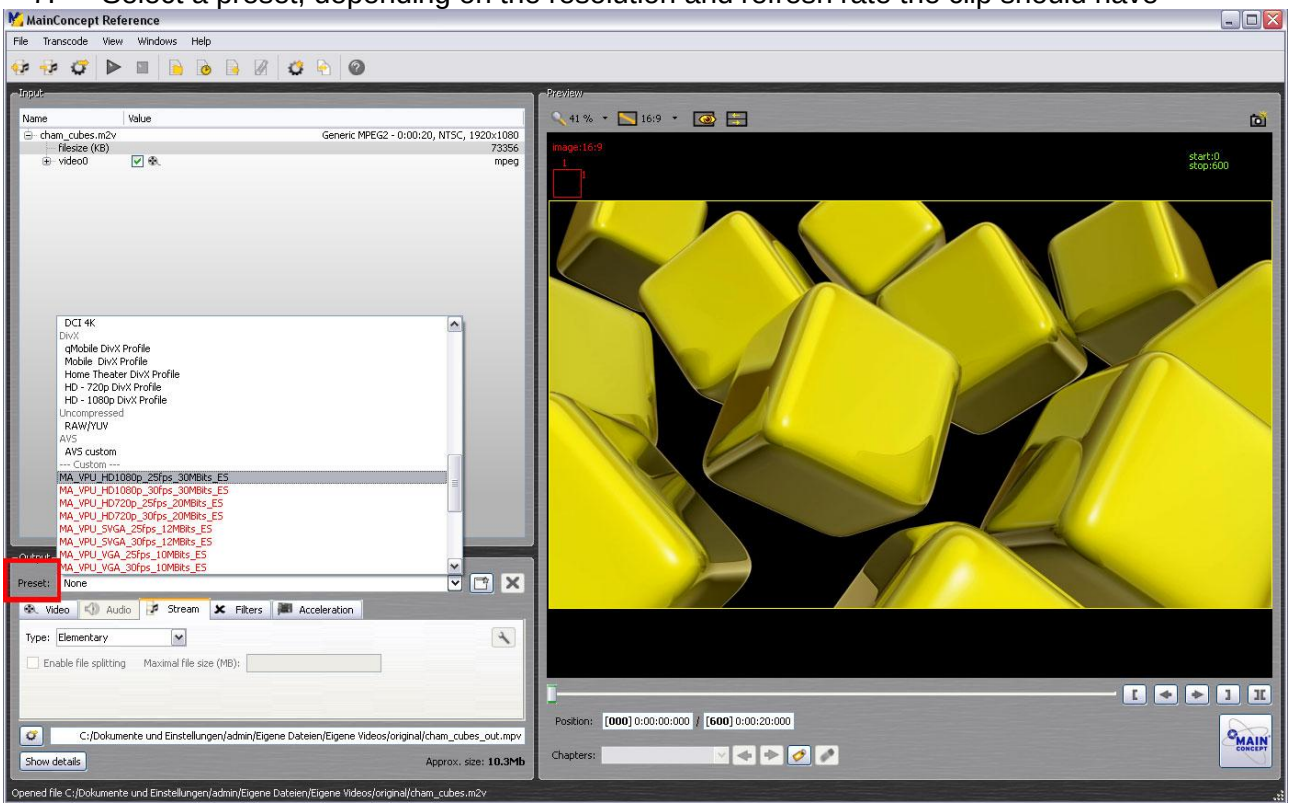

MainConcept Reference
File Transcode View Windows Help
Preset Manager
Preset file: C:/Dokumente und Einstellungen/admin/.mcreference/userprofiles.mps
Preset
Description
1 PAL_10MBits_ES 720x576, 25fps, 10000kbps, 44100Hz stereo, 224kbps
2 NTSC_10MBits_ES 720x480, 29.97fps, 10000kbps, 44100Hz stereo, 224kbps
3 MA_VPU_XGA_30fps_15MBits_PS 1024x768, 30fps, 15000kbps, 48000Hz stereo, 384kbps
4 MA_VPU_XGA_30fps_15MBits_ES 1024x768, 30fps, 15000kbps, 44100Hz stereo, 224kbps
5 MA_VPU_XGA_25fps_15MBits_PS 1024x768, 25fps, 15000kbps, 48000Hz stereo, 384kbps
6 MA_VPU_XGA_25fps_15MBits_ES 1024x768, 25fps, 15000kbps, 44100Hz stereo, 224kbps
7 MA_VPU_VGA_30fps_10MBits_PS 640x480, 30fps, 10000kbps, 48000Hz stereo, 384kbps
8 MA_VPU_VGA_30fps_10MBits_ES 640x480, 30fps, 10000kbps, 44100Hz stereo, 224kbps
9 MA_VPU_VGA_25fps_10MBits_PS 640x480, 25fps, 10000kbps, 48000Hz stereo, 384kbps
10 MA_VPU_VGA_25fps_10MBits_ES 640x480, 25fps, 10000kbps, 44100Hz stereo, 224kbps
11 MA_VPU_SVGA_30fps_12MBits_PS 800x600, 30fps, 12500kbps, 48000Hz stereo, 384kbps
12 MA_VPU_SVGA_30fps_12MBits_ES 800x600, 30fps, 12000kbps, 44100Hz stereo, 224kbps
13 MA_VPU_SVGA_25fps_12MBits_PS 800x600, 25fps, 12500kbps, 48000Hz stereo, 384kbps
14 MA_VPU_SVGA_25fps_12MBits_ES 800x600, 25fps, 12000kbps, 44100Hz stereo, 224kbps
15 MA_VPU_PAL_10MBits_PS 720x576, 25fps, 10000kbps, 48000Hz stereo, 384kbps
16 MA_VPU_NTSC_10MBits_PS 720x480, 29.97fps, 10000kbps, 48000Hz stereo, 384kbps
17 MA_VPU_HD720p_30fps_20MBits_PS 1280x720, 30fps, 20000kbps, 48000Hz stereo, 384kbps
18 MA_VPU_HD720p_30fps_20MBits_ES 1280x720, 30fps, 20000kbps, 44100Hz stereo, 224kbps
19 MA_VPU_HD720p_25fps_20MBits_PS 1280x720, 25fps, 20000kbps, 48000Hz stereo, 384kbps
20 MA_VPU_HD720p_25fps_20MBits_ES 1280x720, 25fps, 20000kbps, 44100Hz stereo, 224kbps
21 MA_VPU_HD1080p_30fps_30MBits_PS 1920x1080, 30fps, 30000kbps, 48000Hz stereo, 384kbps
22 MA_VPU_HD1080p_30fps_30MBits_ES 1920x1080, 30fps, 30000kbps, 44100Hz stereo, 224kbps
23 MA_VPU_HD1080p_25fps_30MBits_PS 1920x1080, 25fps, 30000kbps, 48000Hz stereo, 384kbps
24 MA_VPU_HD1080p_25fps_30MBits_ES 1920x1080, 25fps, 30000kbps, 44100Hz stereo, 224kbps
Remove
Import...
Export...
Close
Input
Output
Preset: None
Video Audio Stream Filters
Type: Elementary
Enable file splitting
Maximal file size (MB):
Show details
Estimated file size: N/A
Position:
Chapters:

5. Open Media, load the video file you want to transcode from your hard drive

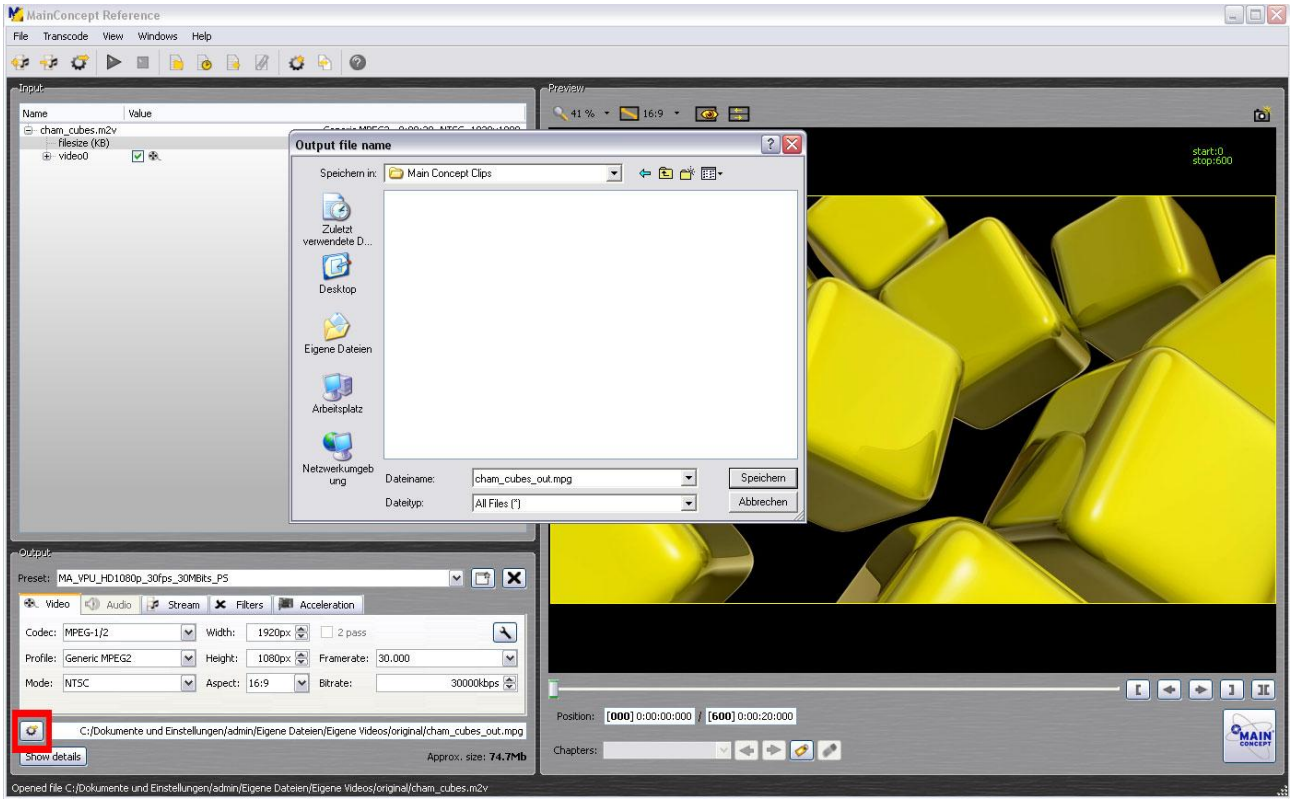


6. Now you see the video file, the Input Source in the preview (right side).

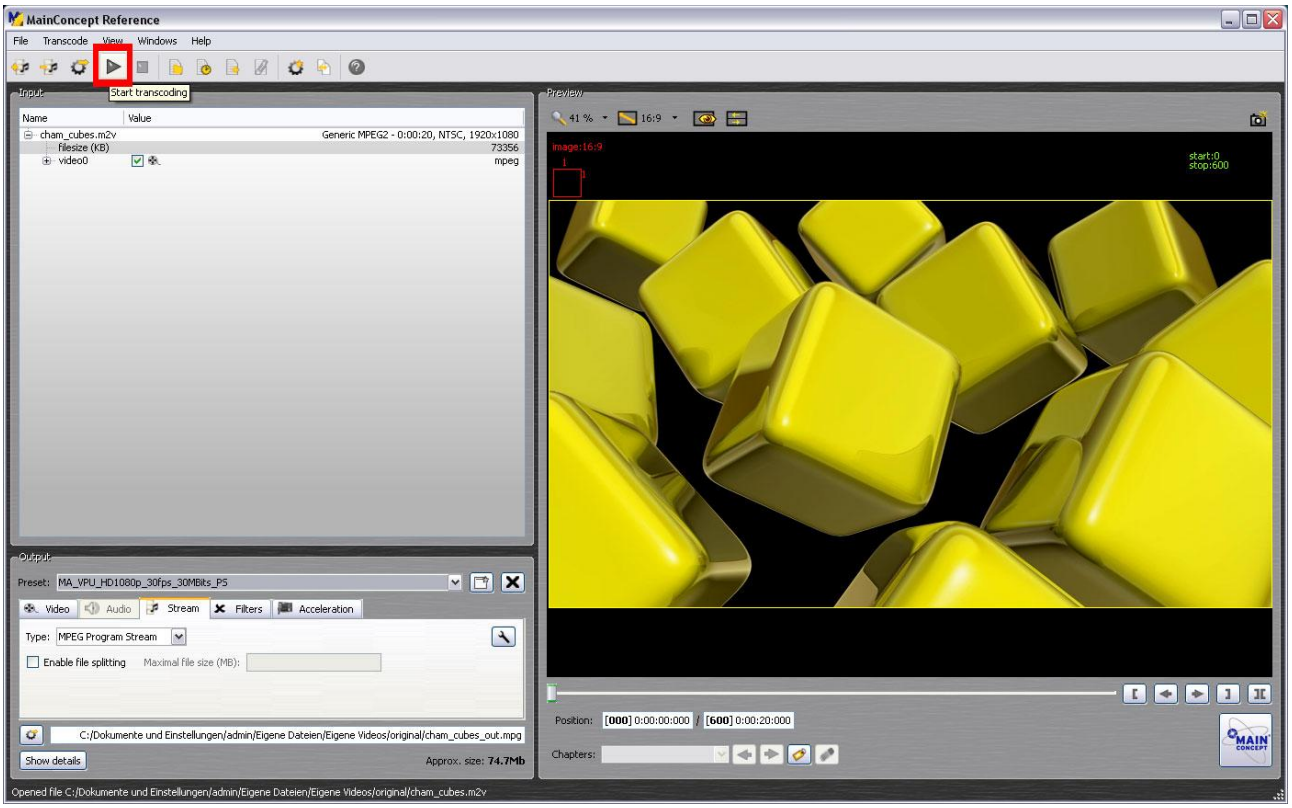
7. Select a preset, depending on the resolution and refresh rate the clip should have



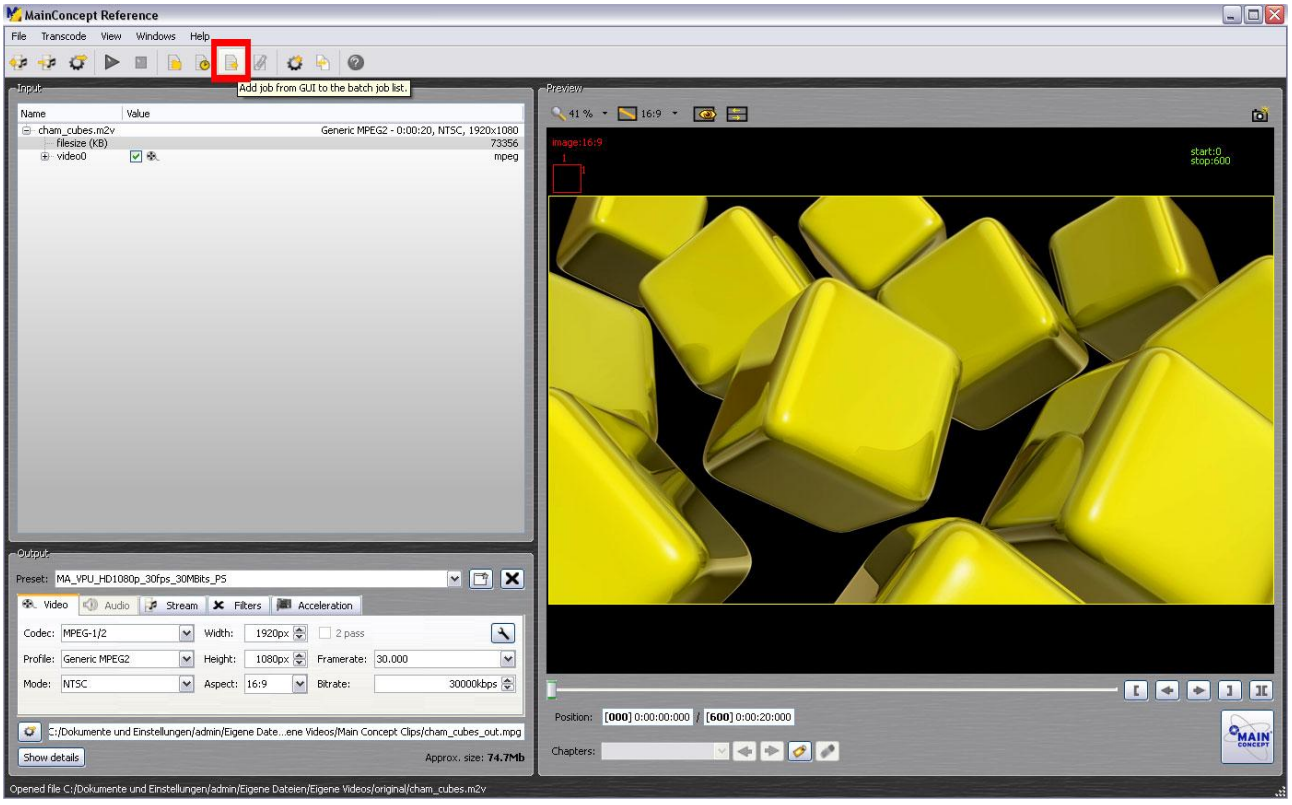
8. Set name and location of the Output File (transcoded clip)



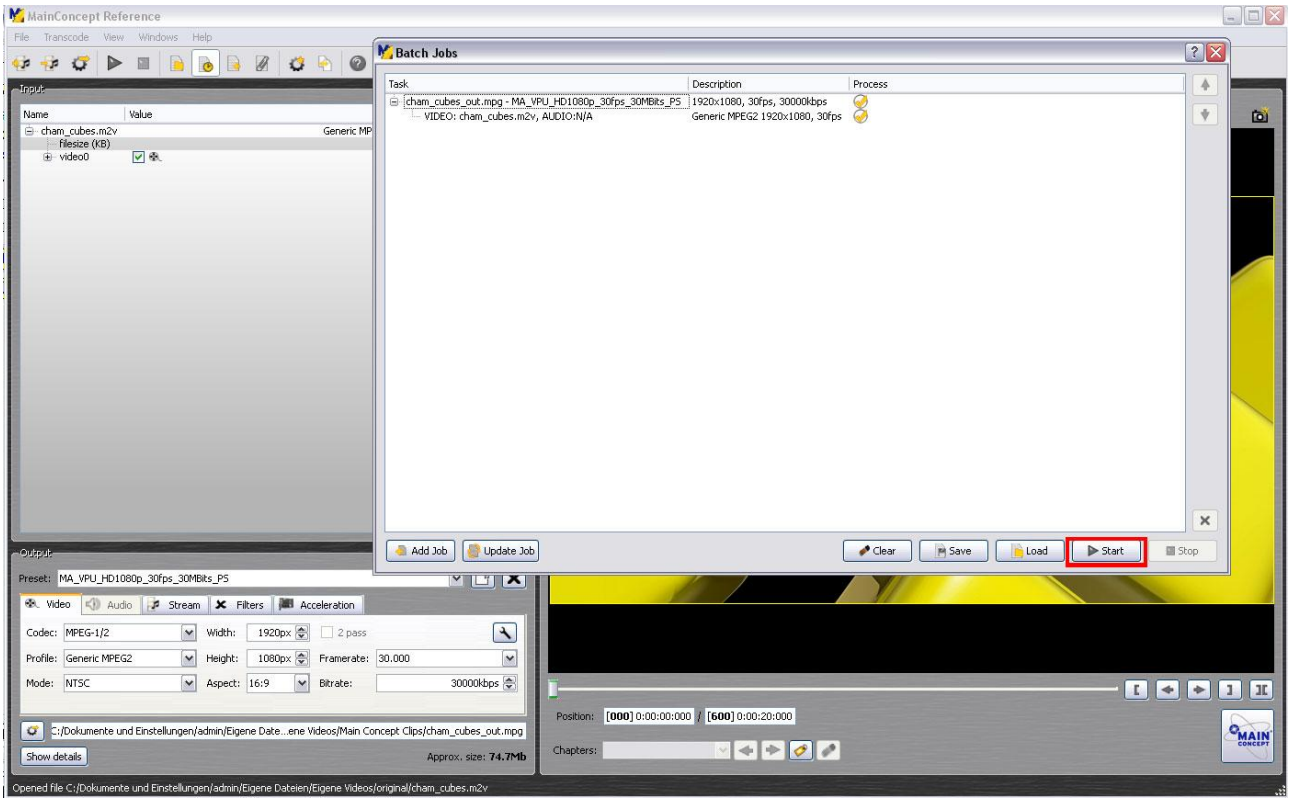
9. Start Transcoding by pressing the Play button



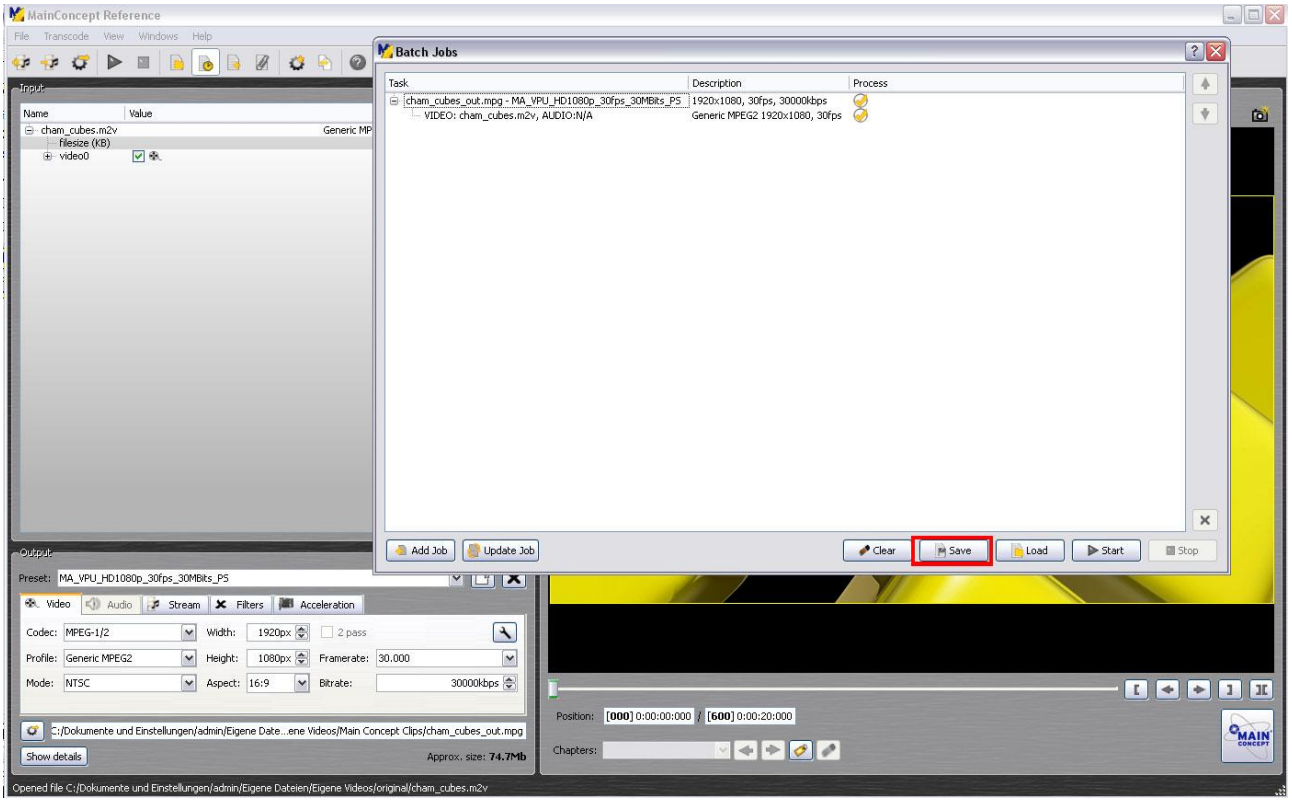
10. If you have more than one clip to be transoded, there are several ways to go. One possibility might be a batch list.
Add the job you just put in to a batch list by pressing the marked button:



11. You can add several jobs to that list by following step 7 to 10 and then 13 again. After that you can start transcoding by pressing the Start button:



12. A batch list can also be saved:



There are several ways how to manage files and transcoding jobs with Main Concept. Please refer to the excellent Main Concept Reference manual for more information.

16 Warnings

SEIZURE WARNING

Some people (about 1 in 4000) may have seizures or blackouts triggered by light flashes or patterns, such as while watching TV or playing video games, even if they have never had a seizure before.

Anyone who has had a seizure, loss of awareness, or other symptom linked to an epileptic condition should consult a doctor before working with the application.

Parents should watch when their children while using the program. Stop working immediately and consult a doctor if you or your child has any of the following symptoms: **Convulsions, Eye or muscle twitching, Loss of awareness, Altered vision, Involuntary movements, Disorientation**.

TO REDUCE THE LIKELIHOOD OF A SEIZURE WHEN WORKING WITH THE PROGRAM:

1. Sit or stand as far from the screen as possible.

2. Use the smallest available screen.

3. Do not work if you are tired or need sleep.

4. Work in a well-lit room.

5. Take a 10 to 15 minute break every hour.

REPETITIVE MOTION INJURIES WARNING

Working with the application can make your muscles, joints or skin hurt after a few hours. Follow these instructions to avoid problems such as Tendonitis, Carpal Tunnel Syndrome or skin irritation:

Take a 10 to 15 minute break every hour, even if you don’t think you need it.

If your hands, wrists or arms become tired or sore while working, stop and rest them for several hours before playing again.

If you continue to have sore hands, wrists or arms during or after play, stop working and see a doctor.

17 Keyboard Shortcuts

Common shortcuts:

View	Key	Function
Preview / Fullscreen	Alt +Enter	Fullscreen / Windowed Mode (only dongle users)
	Shift + Enter	GUI on/off (Graphical User Interface on / off)
	Shift + Mouse	Rotation of selected objects
	Shift + Ctrl + Mouse	Rotation of the selected objects around their centre
Content Editor	Ctrl + X	Cut
	Ctrl + C	Copy
	Ctrl + V	Paste
	Delete	Delete
Warper	Ctrl + Enter	Toggle Warper GUI
	Ctrl + Z	Undo
	Ctrl + Y	Redo
	M	Move
	R	Rotate
	S	Scale
	Shift or Ctrl	Increase or decrease the resolution while mouse movement
	Delete	Delete faces
Pixelmapper	Arrow Key	If a panel is selected in the Graphical View it can be moved
	Arrow + Ctrl	Move panel by 1/10 grid
Startup	F 11 (# < 87) F12 (# >= 87)	Acronis software starts for backup purposes (Not for dongle usurers of former grand MA video)

18 FAQ and Troubleshooting

Please note, that possible installed drivers for example for graphic cards affect the keyboard shortcuts as well.

Should you have any problems with the application, you can refer to the frequently asked questions below:

18.1 Software Questions:

Nr.	Question	Answer
	problems with the communication PC <-> desk	Check the TCP/IP settings: - Is a network card installed? - Is the TCP/IP protocol configured? - The TCP/IP subnet mask of the PC must be equal with the subnet mask of the desk for example 255.255.255.0 - The first 3 numbers of the IP address of the PC must be equal to the first three numbers of the desk for example: PC: 192.168.0.10 Desk: 192.168.0.5 - The last number of the IP address must be unique in the complete network. - Please don't use the automatic distribution of IP settings as offered by Windows because this IPs doesn't fit the requirements. - Check the version. Is it corresponding with the desk version? -Check the VPU mode. Does it match the desk you are using?
	Two network cards installed – no communication with the console	Select the IP address belonging to the network card attached to the grandMA desk. See: 3.4 Connection
	Cannot find the connected grandMA desk	Check the IP Settings. See: 3.4 Connection Check version

Nr.	Question	Answer
		Check VPU mode
	Video codec's	Recommended Video Codec's: At the moment we get the best results with the "MPEG2" codec.
	Fullscreen black	Check dongle The "Fullscreen" mode requires the dongle. Check connectivity. No output out of session.
	Fullscreen shuts off	Disable the screensaver and power management
	Firewalls and Antivirus Software. Program won't start or PC looses connection	The MS firewall that comes with SP 2 makes no problems. After the installation you must allow MA VPU and onPC the access to the network. Third party firewalls and anti virus software must be configured. If this doesn't help, the programs have to be disabled or de-installed. Note that in this case the virus protection etc. doesn't work. (To configure your firewall enable the Remote Call TCP Port 7003 in your Firewall Options)
	Bad Performance	Disable virus checks on the content files like .AVI; .IMG or .MOV files! Change the Device Settings from, RGB Emulation to HAL: Settings/Options/Driver
	Content Browsing from desk doesn't work	Check the IP-address (same subnet!) and configure or disable the firewall. Properties of Hardware Interface - disable Checksum Offload in the advanced Setting of the Network Adapter.
	Black output screen	- May be your graphics board has too less memory (64 MB or less) and you are using a high display resolution (e.g. 1400 *1050). Reduce the screen resolution. DMX channels are not patched Check DMX sheet Check grandmaster Check shapers Dimmer, Grandmaster, Blades closed 3D Object moved out of focus or wrong scaled

Nr.	Question	Answer
		Keystoning parameter stupid No valid Fixture Layer Output device (for example a projector) doesn't support the high resolution
	(Only for users with dongle!) Video Capture Cards: The Decklink Blackmagic SDI Capture Cards can support two SDI Inputs. Does this work with MA VPU? Live Input (BM DeckLink Card) Stream freezes:	If the card works with the Windows Direct Show this should work. We have tested the small SDI-In card and the PCI Express Extreme. Here we only have the possibility to choose one video (from the Decklink driver) – As mentioned, if there is a card that supports two interfaces via the driver we'll support this. Enable the "Watchdog" (Settings/Options/Video)
	Is the smallest Blackmagic SDI Capture card sufficient, I mean the card that does not support HDTV ?	See 0
	PCI or PCIe SDI capturing? The bus type is irrelevant?	Yes
	No administration rights	To work with MA VPU without administration rights you have to arrange the administration rights by the administrator on the installation path e.g.: C:\Program Files\MA Lighting Technologies\MA VPU Software
	System crashes or stocks	The Widows XP Service Pack 2 must be installed
	Video cannot be shown	Maybe codec problems.
	Timing problems with Dual Core processors	The use of Dual Core processors can cause timing problems. Please use the actual drivers of the processor manufacturer. If you have further problems set the switch via the menu entry ‚Settings – Options – Dual Core'.
	No layers displayed in Multi Preview	No fixture Layer is selected

19 Supplement MA Lighting

19.1 Intended use

The MA Video Processing Unit (VPU) is an element of the MA system family. Intended use is output of audio and video via DVI or ArtNet. Three different versions of the MA VPU are available to suit all needs: MA VPU pro, MA VPU plus and MA VPU basic. With a huge amount of functions, features and effects together with any console of the grandMA family these will be the most innovative tool available to control visual effects independent of the type of fixtures needing control.

Video processing unit

Manufacturer: MA Lighting Technology GmbH

Dachdeckerstraße 16

D – 97297 Waldbüttelbrunn

Germany

19.2 Data

Voltage: 230 V ~ 50Hz
120 V ~ 60 Hz (USA, Canada)
No switching necessary!

Cable type: Only adequately protected cables may be used (min. Ø 3 x 1,0mm²)
(Power supply cable and connector not included ex works)

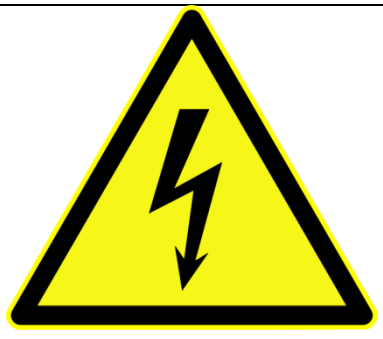
Socket type Power In: PowerCon (blue) by NEUTRIK AG, Liechtenstein

Socket type Power Out: PowerCon (grey) by NEUTRIK AG, Liechtenstein

ATTENTION! The total current power consumption of the units connected in series must not exceed the maximum of the power source!

Rated Power Consumption:
VPU BASIC: max. 300 VA
VPU PLUS: max. 400 VA

19.3 Symbols and warning labels

		I 0	~
Warning Danger Area	Warning Danger of electric shock	Supply voltage ON/OFF	Alternating current (AC)

19.4 LIMITATIONS

The screens of grandMA2 series and other units of the new generation are subject to conditions of failure class 2. Following items are acceptable and no reason to worry:

ITEMS:	ACCEPTABLE COUNTS:
Permanent bright dots	max 2 (minimum distance between bright dots ≥ 15mm)
2 dots adjacent permanent bright	max 1
Permanent dark dots	max 5 (minimum distance between dark dots ≥ 15mm)
2 dots adjacent permanent dark	max 1
Total bright and dark dots	max 5

19.5 Transport

Please be aware of the weight of the product. Be careful when moving it; otherwise you may injure your back or other parts of your body.

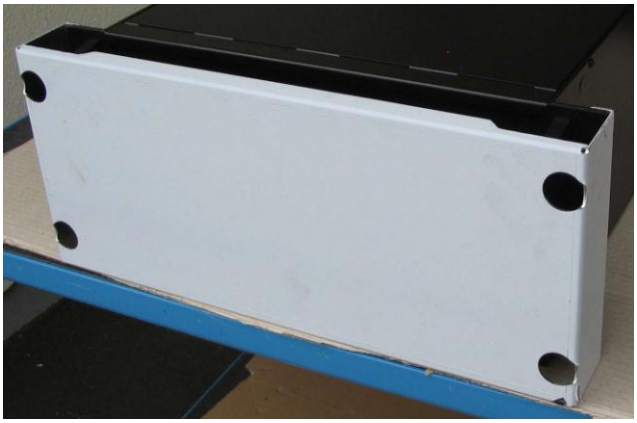
Video processing unit (VPU) approx. 15 kg (+ 0,8 kg transport protector)

Secure all covers prior to transport. Remove all cables on the back cover and the USB connectors on the front panel

Handles on the products are designed exclusively for personnel to hold or carry the product. It is therefore not permissible to use handles for fastening the product to or on means of transport such as cranes, fork lifts, wagons, etc. The user is responsible for securely fastening the products to or on the means of transport and for observing the safety regulations of the manufacturer of the means of transport. Noncompliance can result in personal injury or material damage.

Use original MA-Case for transport and storage or comparable transport device.

If the front of the VPU cannot be protected with a transport case, install the protection cover.



Do not place the unit on surfaces, vehicles, cabinets or tables that for reasons of weight or stability are unsuitable for this purpose. Do not twist the body.

Check the apparatus after transport before installation!
If body of the apparatus is damaged (bend or broken), monitor is broken or connectors are damaged do not connect the apparatus to power! Call our hotline for technical support!

19.6 General Safety Instructions

Read all the instructions in the user's manual, especially the safety requirements see Safety requirements

Follow all instructions. Keep the user's manual for later use.

Follow all cautions and warnings indicated on the unit.

Disconnect the mains plug before cleaning the unit; don't use any liquid or spray cleanser. Clean with a dry cloth.

Do not use the unit near water. Do not expose it to a humid environment. Do not spill any liquid over the unit.

Unplug this apparatus during lightning storms or when unused for long periods of time.

Do not block or cover any ventilation slots in the housing - they guarantee the reliable functioning of the unit and protect it against overheating. Do not install the unit into a frame unless sufficient ventilation is guaranteed. Install in accordance with the manufacturer's instructions.

Do not insert any objects through the slots of the unit, as these could get in contact with live parts or could cause short circuits. This may cause a fire and an electric shock.

Do not place the unit on unstable surfaces. It may fall and get damaged.

Do not place any objects on the power cord. Protect it from being walked on or pinched particularly at plugs and the point where they exit from the apparatus.

If using an extension cord, make sure the rated output of all units connected in aggregate does not exceed the maximum rated output of the extension cord. The rated output of the units plugged into the socket should in aggregate not exceed 10 amperes.

If the power cord or the mains plug is damaged, let a qualified technician replace it immediately.

Only use power cords which are marked as safety-proof.

All service work should be exclusively performed by qualified service technicians.

Do not use any high-power walkie-talkies or cellular phones near the unit.

The unit is provided with a safety plug. This plug can only be used with safety sockets. These precautions should by all means be followed. If the plug should not fit into a given socket (e.g. the case with old sockets), the socket should be replaced by an electrician.

Do not ignore the safety purpose of the grounding-type plug. A grounding type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

As with all industrially manufactured goods, the use of substances that induce an allergic reaction such as aluminium cannot be generally excluded. If you develop an allergic reaction (such as a skin rash, frequent sneezing, red eyes or respiratory difficulties), consult a physician immediately to determine the cause.

Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped. Besides others, you run the risk of suffering an electric shock.

If one of the following conditions occurs, please disconnect the mains plug and call your dealer or technical support!

Power cord or mains plug is damaged or worn.

Liquid penetrated the unit.

The unit was exposed to rain or high ambient humidity.

The unit does not function properly, even when following all the instructions in the manual. Only manipulate the controls as stated in the manual, wrong settings on the controls may damage the unit.

The unit fell and the housing was damaged.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE

19.7 IMPORTANT SAFETY INSTRUCTIONS

Read these instructions.

Keep these instructions.

Heed all warnings.

Do not use this apparatus near water.

Clean only with dry cloth.

Do not block any ventilation openings.

Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.

Protect the power cord (not included) from being walked on or pinched particulary ar plugs, convenience receptacles, and the point where they exist from the apparatus.

Only use attachments / accessories specified by the manufacturer.

When a cart is used, use caution when moving the cart / apparatus combination to avoid injury from tip-over.

Unplug this apparatus during lighting storms or when used for long period of time.

Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.

19.8 Electric shock warning on the rear of the *grandMA*

The unit should be serviced by qualified personnel only, as live parts may be exposed when opening and/or removing coverings; besides others, you run the risk of suffering an electric shock.

19.9 Safety and Environment

Operating Limits

Temperature: 0°C - 30°C / 32°F – 86°F (recommended 10°C – 25°C / 50°F – 77°F, due to extreme processing power)
Deeper temperature can cause failure of the displays, higher temperature can overcharge the cooling system of the apparatus and can destroy hardware components.

Humidity: Operation: 20% - 80% relative humidity (no condensation)
Storage: 10% - 80% relative humidity (no condensation)

Environment

Follow all the IMPORTANT SAFETY INSRUCTIONS.
Use the apparatus only within the environment operating limits.
Use the apparatus only indoor.
Air must be free of dust and hazardous and explosive substances.
Avoid vibrating support, and extreme loud environment
This apparatus is not protectet against splash water. Do not use this apparatus near water
Do not use the apparatus in rain or moisture.

19.10 Quickstart Connect

2x DVI OUT + EDID Switches

Mains switch ON / OFF (In standby mode – switch on "**I**", the AC power voltage is present within the instrument, even if the apparatus is switched off by the push button on the front)

Mains Input (blue) 120 / 230V, 50/60Hz no switching of voltage necessary (Cable not included ex works)

Mains Output (grey) 120 / 230V, 50/60Hz no switching of voltage necessary (Cable not included ex works)

2x Ethernet
(for connecting MA-consoles, grandMA onPC ....)

SDI In 1 + 2 (option)

2x USB e.g. mouse, keyboard, storage device
(+ 2 more USB at the front panel)

Audio OUT Left / Right

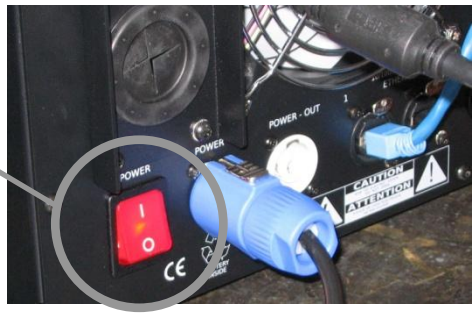
eSATA – port for connecting external drive
Use only cable with max length 0,5m!
Do not disconnect drive when at work!

19.11 Switching the apparatus On/Off

Caution: Do not power down during booting. Such a switch-off may lead to corruption of the solid state disk files.

Power connector

AC power switch on the rear panel



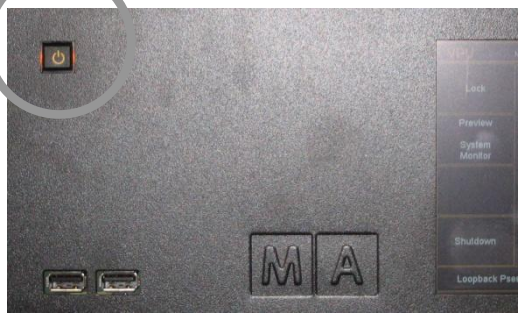
Position I = ON
In the I position, the instrument is in standby mode or in operation, depending on the position of the ON/STANDBY key at the front panel.

Note:
The AC power switch may remain ON continuously.
Switching to OFF is only required when the instrument must be completely removed from the AC power source.

Position O = OFF
The 0 position implies an all-pole disconnection of the instrument from the AC power source.

Standby switch

ON/STANDBY button on the front panel



The ON/STANDBY switch activates two different operating Modes:

Operation ON –
First push on ON/STANDBY – button
The apparatus starts booting.

STANDBY –
Second push on ON/STANDBY – button
The apparatus switch to standby - mode

Caution:
In standby mode, the AC power voltage is present within the apparatus

Switching On the Instrument

In order to switch on the apparatus, set the power switch on the rear panel to position I. Set the apparatus to operating mode by pressing the ON/STANDBY button on the front panel.

Switching Off the Instrument

In order to switch off the apparatus, push the ON / STANDBY button on the front panel and

confirm with the soft button “YES”. In this standby mode, the AC power voltage is present within the instrument. For longer non use switch the power switch to “**0**”

Cleaning

The VPU demands only minor attention. Clean the surface only with dry soft cloth and look for proper condition of ventilation. Do not use any liquid cleaner or compressed air.

19.12 Maintenance

Electric shock warning: The unit should be serviced by qualified personnel only, as live parts may be exposed when opening and/or removing coverings; besides others, you run the risk of suffering an electric shock.

19.13 Conformity

Declaration of Conformity according to directives 2004 / 108 / EG

Manufacturer’s name: MA Lighting Technology GmbH

Manufacturer’s address: Dachdeckerstraße 16
D-97297 Waldbüttelbrunn
Germany

declares that the product

Product category: Control unit

Name of product: Video Processing Unit (VPU)

complies with the following product specifications:

Safety: EN60065, EN60950

EMV (EMC): EN55103-1 (E1)

EN55103-2 (E2)

Additional information: DMX512, Ethernet, USB. Malink, DVI, LTC, Audio IN, Midi and analogue inputs must be shielded and the shielding must be connected to the earthing resp. to the housing of the corresponding plug.

Waldbüttelbrunn, 22.08.2008

Dipl. Ing. Michael Adenau

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